

# Guidelines and Standards for Flood Risk Analysis and Mapping

## Appendix L: Guidance for Preparing Digital Data and Flood Insurance Rate Map Databases

October 2011



**FEMA**

# Summary of Changes for Appendix L

## Guidance for Preparing Digital Data and FIRM Databases

The following Summary of Changes details the revisions to Appendix L subsequent to the initial publication of the Appendix in February 2002. These changes represent new or updated guidance for flood risk analysis and mapping.

Date	Affected Section(s)	Summary of Change
April 2003	Purpose	Clarified that the FEMA Project Officer assigns tasks to the mapping partner(s).
April 2003	L.1	Corrected typographic errors.
April 2003	L.1	Expanded the description of the Standard and Enhanced DFIRM Databases.
April 2003	L.1	Rearranged table L-1 alphabetically.
April 2003	L.1	Removed L_Riv_Model from table L-1.
April 2003	L.1	Removed duplicate L_Stn_Start from table L-1.
April 2003	L.1	Added the Enhanced DFIRM Database tables to table L-1.
April 2003	L.1	Removed L_Cst_Model from table L-2.
April 2003	L.1	Removed L_Riv_Model from table L-2.
April 2003	L.1	Added the Enhanced DFIRM Database tables to table L-2.
April 2003	L.1	Added a discussion on Database Design Decisions.
April 2003	L.1.2	Expanded the discussion on what option mapping partners should follow for their submission.
April 2003	L.1.2	Corrected section cross-references.
April 2003	L.1.2	Clarified that mapping partners submitting Draft digital data may use either Preliminary and Final DFIRM Data structure or Draft Digital Data structure.
April 2003	L.1.2	Corrected typographic errors.
April 2003	L.2.1	Corrected typographic error.
April 2003	L.2.1	Clarified that the Appendix provides a standard schema.
April 2003	L.2.4	Corrected typographic error.
April 2003	L.2.4	Clarified the requirements for the study's projection.
April 2003	L.2.5	Clarified that the arrangements are made with the FEMA Project Officer.
April 2003	L.2.5.3	Corrected typographic error.
April 2003	L.2.5.3	Corrected formatting error.
April 2003	L.2.5.8	Added PLSS tables to base map tables that need not follow the DFIRM structure if existing data are used.
April 2003	L.2.5.8	Corrected typographic error.
April 2003	L.2.5.8	Modified discussion to explain the relationship between the base map to the flood hazard data.
April 2003	L.2.5.8	Removed the flood hazard data tables from Table L-5.
April 2003	L.2.5.9	Clarified that attribute tables are required to have a primary key that matches the spatial data table only when attribute data and spatial data are stored in separate files such as with a CADD data format or when attributes for GIS data are stored in a separate RDBMS.
April 2003	L.2.5.9	Corrected section cross-references.
April 2003	L.2.5.10	Added a discussion on Standard and Enhanced required components.
April 2003	L.2.5.10	Described the Standard/Enhanced code used L.4 and L.7.

Date	Affected Section(s)	Summary of Change
April 2003	L.2.5.10	Enhanced discussion of Null values for various data types. Added discussion of "Not Populated" values for situations where data does not follow requirements of specification.
April 2003	L.2.5.10	Added discussion of true/false fields in the DFIRM Database.
April 2003	L.2.5.10	Corrected typographic errors.
April 2003	L.2.6	Corrected section cross-references.
April 2003	L.2.6	Corrected typographic error.
April 2003	L.2.7	Clarified that metadata file is provided in ASCII text format.
April 2003	L.2.7.2	Corrected section cross-references.
April 2003	L.2.7.2	Corrected typographic error.
April 2003	L.2.7.2	Added SID and PNG as acceptable raster formats.
April 2003	Purpose	Clarified that the FEMA Project Officer assigns tasks to the mapping partner(s).
April 2003	L.1	Corrected typographic errors.
April 2003	L.1	Expanded the description of the Standard and Enhanced DFIRM Databases.
April 2003	L.1	Rearranged table L-1 alphabetically.
April 2003	L.1	Removed L_Riv_Model from table L-1.
April 2003	L.1	Removed duplicate L_Stn_Start from table L-1.
April 2003	L.1	Added the Enhanced DFIRM Database tables to table L-1.
April 2003	L.1	Removed L_Cst_Model from table L-2.
April 2003	L.1	Removed L_Riv_Model from table L-2.
April 2003	L.1	Added the Enhanced DFIRM Database tables to table L-2.
April 2003	L.1	Added a discussion on Database Design Decisions.
April 2003	L.1.2	Expanded the discussion on what option mapping partners should follow for their submission.
April 2003	L.1.2	Corrected section cross-references.
April 2003	L.1.2	Clarified that mapping partners submitting Draft digital data may use either Preliminary and Final DFIRM Data structure or Draft Digital Data structure.
April 2003	L.1.2	Corrected typographic errors.
April 2003	L.2.1	Corrected typographic error.
April 2003	L.2.1	Clarified that the Appendix provides a standard schema.
April 2003	L.2.4	Corrected typographic error.
April 2003	L.2.4	Clarified the requirements for the study's projection.
April 2003	L.2.5	Clarified that the arrangements are made with the FEMA Project Officer.
April 2003	L.2.5.3	Corrected typographic error.
April 2003	L.2.5.3	Corrected formatting error.
April 2003	L.2.5.8	Added PLSS tables to base map tables that need not follow the DFIRM structure if existing data are used.
April 2003	L.2.5.8	Corrected typographic error.
April 2003	L.2.5.8	Modified discussion to explain the relationship between the base map to the flood hazard data.
April 2003	L.2.5.8	Removed the flood hazard data tables from Table L-5.
April 2003	L.2.5.9	Clarified that attribute tables are required to have a primary key that matches the spatial data table only when attribute data and spatial data are stored in separate files such as with a CADD data format or when attributes for GIS data are stored in a separate RDBMS.
April 2003	L.2.5.9	Corrected section cross-references.
April 2003	L.2.5.10	Added a discussion on Standard and Enhanced required components.
April 2003	L.2.5.10	Described the Standard/Enhanced code used L.4 and L.7.

Date	Affected Section(s)	Summary of Change
April 2003	L.2.5.10	Enhanced discussion of Null values for various data types. Added discussion of "Not Populated" values for situations where data does not follow requirements of specification.
April 2003	L.2.5.10	Added discussion of true/false fields in the DFIRM Database.
April 2003	L.2.5.10	Corrected typographic errors.
April 2003	L.2.6	Corrected section cross-references.
April 2003	L.2.6	Corrected typographic error.
April 2003	L.2.7	Clarified that metadata file is provided in ASCII text format.
April 2003	L.2.7.2	Corrected section cross-references.
April 2003	L.2.7.2	Corrected typographic error.
April 2003	L.2.7.2	Added SID and PNG as acceptable raster formats.
April 2003	Purpose	Clarified that the FEMA Project Officer assigns tasks to the mapping partner(s).
April 2003	L.1	Corrected typographic errors.
April 2003	L.1	Expanded the description of the Standard and Enhanced DFIRM Databases.
April 2003	L.1	Rearranged table L-1 alphabetically.
April 2003	L.1	Removed L_Riv_Model from table L-1.
April 2003	L.1	Removed duplicate L_Stn_Start from table L-1.
April 2003	L.1	Added the Enhanced DFIRM Database tables to table L-1.
April 2003	L.1	Removed L_Cst_Model from table L-2.
April 2003	L.1	Removed L_Riv_Model from table L-2.
April 2003	L.1	Added the Enhanced DFIRM Database tables to table L-2.
April 2003	L.1	Added a discussion on Database Design Decisions.
April 2003	L.1.2	Expanded the discussion on what option mapping partners should follow for their submission.
April 2003	L.1.2	Corrected section cross-references.
April 2003	L.1.2	Clarified that mapping partners submitting Draft digital data may use either Preliminary and Final DFIRM Data structure or Draft Digital Data structure.
April 2003	L.1.2	Corrected typographic errors.
April 2003	L.2.1	Corrected typographic error.
April 2003	L.2.7.2	Changed references to orthophotos to the less restrictive description of raster base maps.
April 2003	L.2.7.2	Modified the data directory structure.
April 2003	L.2.8	Corrected typographic error.
April 2003	L.2.8	Corrected structure of metadata file name.
April 2003	L.3.2.1	Corrected typographic error.
April 2003	L.3.2.1	Corrected section cross-references.
April 2003	L.3.5	Corrected section cross-references.
April 2003	L.3.5.1	Clarified discussion of Tiling.
April 2003	L.3.5.2	Clarified discussion of nodes and vertices for Topology.
April 2003	L.3.5.3	Corrected section cross-references.
April 2003	L.3.5.4	Corrected section cross-references.
April 2003	L.3.5.5	Corrected section cross-references.
April 2003	L.3.5.6	Clarified that issues will be resolved the FEMA Project Officer.
April 2003	L.3.5.7	Corrected section cross-references.
April 2003	L.3.5.8	Added PLSS tables to base map tables that need not follow the DFIRM structure if existing data are used. Clarified the tables to which this exception applies.
April 2003	L.3.5.8	Modified discussion to explain the relationship between the base map to the flood hazard data.
April 2003	L.3.5.8	Removed the flood hazard data tables from Table L-7.

Date	Affected Section(s)	Summary of Change
April 2003	L.3.5.11	Added a discussion on Standard and Enhanced required components.
April 2003	L.3.5.11	Described the Standard/Enhanced code used L.4 and L.7.
April 2003	L.3.5.11	Enhanced discussion of Null values for various data types. Added discussion of "Not Populated" values for situations where data does not follow requirements of specification.
April 2003	L.3.5.11	Corrected typographic error.
April 2003	L.3.5.11	Added discussion of true/false fields in the DFIRM Database.
April 2003	L.3.7	Clarified that the mapping partner should submit the FEMA Mapping Information Checklist.
April 2003	L.3.7	Clarified that the FIS report text should be in PDF format with appropriate bookmarks.
April 2003	L.3.7.2	Corrected typographic error.
April 2003	L.3.7.2	Changed references to orthophotos to the less restrictive description of raster base maps.
April 2003	L.3.7.2	Corrected reference to format of preliminary data files for QA/QC.
April 2003	L.3.7.2	Modified the data directory structure.
April 2003	L.3.8	Corrected typographic error.
April 2003	L.3.8	Corrected structure of metadata file name.
April 2003	L.4 S_BFE	Corrected typographic error.
April 2003	L.4 S_BFE	Renamed UNITS_LID field to LEN_LID.
April 2003	L.4 S_CBRS	Changed CBRS_LID and CBRS_DATE to required if applicable instead of required.
April 2003	L.4 S_CBRS	Expanded description of the CBRS_TF field.
April 2003	L.4 S_CBRS	Clarified description of the S_CBRS table.
April 2003	L.4 S_CBRS	Clarified description of the CBRS_DATE field.
April 2003	L.4 S_Cst_Gage	Added the S_Cst_Gage table.
April 2003	L.4 S_Cst_Tsct_Ln	Removed CST_MDL_ID.
April 2003	L.4 S_Cst_Tsct_Ln	Added Enhanced attributes.
April 2003	L.4 S_DOQ_Index	Renamed the S_DOQ_Index table to S_Base_Index.
April 2003	L.4 S_DOQ_Index	Renamed DOQ_ID field to BASE_ID.
April 2003	L.4 S_DOQ_Index	Renamed DOQ_DATE field to BASE_DATE.
April 2003	L.4 S_DOQ_Index	Changed references to orthophotos to the less restrictive description of raster base maps.
April 2003	L.4 S_FIRM_Pan	Changed the requirement for panels that extend past the administrative boundaries of the area mapped to extend out to the mapped panel neatlines rather than be clipped to the boundary of the area mapped.
April 2003	L.4 S_FIRM_Pan	Changed capitalization of PNP_REASON.
April 2003	L.4 S_Fld_Haz_Ar	Expanded description of SFHA_TF field.
April 2003	L.4 S_Fld_Haz_Ar	Clarified that the units field applies to depths as well as BFEs.
April 2003	L.4 S_Fld_Haz_Ar	Added a DEP_REVERT field to hold a depth value for AR zones that required depths for the reverted zone.
April 2003	L.4 S_Fld_Haz_Ar	Expanded discussion of SOURCE_CIT to say that the flood zones will be divided to track the sources of the most recent revision, but not previous revisions.
April 2003	L.4 S_Fld_Haz_Ar	Renamed UNIT_LID field to LEN_LID.
April 2003	L.4 S_Fld_Haz_Ar	Renamed VEL_UNITS field to VEL_LID.
April 2003	L.4 S_Fld_Haz_Ar	Added Enhanced attributes.
April 2003	L.4 S_Fld_Haz_Ln	Removed the SOURCE_CIT field.
April 2003	L.4 S_Gen_Struct	Changed the field WTR_NM to WTR_LID.
April 2003	L.4 S_Label_Ld	Corrected typographic error.
April 2003	L.4 S_Label_Pt	Expanded description of DEGREES field.

Date	Affected Section(s)	Summary of Change
April 2003	L.4 S_LOMR	Clarified that the polygon is the outline shown on the LOMR attachment.
April 2003	L.4 S_LOMR	Added Enhanced attributes.
April 2003	L.4 S_Nodes	Added the S_Nodes table.
April 2003	L.4 S_OvrbnkLn	Added the S_OvrbnkLn table.
April 2003	L.4 S_Perm_Bmk	Corrected typographic error.
April 2003	L.4 S_PFD_Ln	Added the S_PFD_Ln table.
April 2003	L.4 S_PLSS_Ar	Corrected typographic error.
April 2003	L.4 S_PLSS_Ln	Changed the requirements for PLSS data to be analogous to Transportation and Water features. Existing data used for a DFIRM is not required to be restructured to follow the DFIRM Database specification. The table is not required if the data used for the hard copy map is not available for free public distribution by FEMA.
April 2003	L.4 S_Pol_Ar	Fixed confusion between the COMM_NO and the CID fields. The CID field is the concatenation of the two –digit State FIPs code and COMM_NO.
April 2003	L.4 S_Pol_Ar	Added text values to use for COMM_NO when local jurisdiction does not apply to an area.
April 2003	L.4 S_Pol_Ar	Fixed capitalization of POL_NAME1 and POL_NAME2.
April 2003	L.4 S_Pol_Ar	Expanded description of ANI_TF field.
April 2003	L.4 S_Pol_Ar	Removed SOURCE_CIT field.
April 2003	L.4 S_Pol_Ar	Corrected typographic error.
April 2003	L.4 S_Precip_Gage	Added the S_Precip_Gage table.
April 2003	L.4 S_Profil_BasLn	Added the S_Profil_BasLn table.
April 2003	L.4 S_Quad	Renamed table S_Quad to S_Quad_Index.
April 2003	L.4 S_Shore_Ln	Added the S_Shore_Ln table .
April 2003	L.4 S_Stn_Start	Added the S_Stn_Start table.
April 2003	L.4 S_Subbasins	Added the S_Subbasins table.
April 2003	L.4 S_Trnsport_Ln	Changed NM_TYP field to NM_LID.
April 2003	L.4 S_Trnsport_Ln	Changed references to orthophotos to the less restrictive description of raster base maps.
April 2003	L.4 S_Trnsport_Ln	Clarified that FEAT_NM1 should also be used for route numbers and “Intracoastal Waterway.”
April 2003	L.4 S_Water_Gage	Added the S_Water_Gage.
April 2003	L.4 S_Wtr_Ar	Changed references to orthophotos to the less restrictive description of raster base maps.
April 2003	L.4 S_Wtr_Ar	Changed reference to table name D_Wtr_Typ to D_Water_Typ.
April 2003	L.4 S_Wtr_Ln	Changed references to orthophotos to the less restrictive description of raster base maps.
April 2003	L.4 S_Wtr_Ln	Changed reference to table name D_Wtr_Typ to D_Water_Typ.
April 2003	L.4 S_XS	Added fields for vertical datum and units that apply to the WSEL_100 field.
April 2003	L.4 S_XS	Removed field XS_NO.
April 2003	L.4 S_XS	Renamed WSEL_100 field to WSEL_REG.
April 2003	L.4 S_XS	Renamed UNITS_LID field to LEN_LID.
April 2003	L.4 S_XS	Corrected typographic error by renaming V_DATUM_LID field to V_DATM_LID.
April 2003	L.4 S_XS	Removed the RIV_MDL_ID field.
April 2003	L.4 S_XS	Fixed formatting error.
April 2003	L.4 S_XS	Clarified that XS_LTR can be either a letter or a number.
April 2003	L.4 S_XS	Added Enhanced attributes.
April 2003	L.4 Study_Info	Changed the STUDY_PRE field and JURIS_TYP field to required if applicable rather than required.

Date	Affected Section(s)	Summary of Change
April 2003	L.4 Study_Info	Expanded description of OPP_TF field.
April 2003	L.4 Study_Info	Expanded description of CW_TF field.
April 2003	L.4 Study_Info	Expanded description of RTROFT_TF field.
April 2003	L.4 Study_Info	Added META_NM field.
April 2003	L.4 Study_Info	Removed UNIT_LID from matrix.
April 2003	L.4 Study_Info	Added Enhanced attributes.
April 2003	L.4 L_Aux_Data	Added the S_Aux_Data table.
April 2003	L.4 L_Case_Info	Added the S_Case_Info table.
April 2003	L.4 L_Comm_Info	Clarified that all communities within the area of study are included in the table.
April 2003	L.4 L_Comm_Info	Changed REPOS_ADR2 to required if applicable rather than required.
April 2003	L.4 L_Comm_Info	Expanded description of REPOS_ST.
April 2003	L.4 L_Comm_Info	Expanded description of IN_ID_DAT field.
April 2003	L.4 L_Comm_Info	Expanded description of IN_NFIP_DT field.
April 2003	L.4 L_Comm_Info	Expanded description of IN_FRM_DAT field.
April 2003	L.4 L_Comm_Info	Expanded description of IN_RECENT_DAT field.
April 2003	L.4 L_Cst_Model	Removed from Standard. Existing attributes and additional attributes were added as part of the Enhanced.
April 2003	L.4 L_Hydra_Model	Added the L_Hydra_Model table.
April 2003	L.4 L_Hydro_Model	Added the L_Hydro_Model table.
April 2003	L.4 L_Media	Added the L_Media table.
April 2003	L.4 L_MT1_LOMC	Added a value of "redetermined" for LOMCs included in Draft Digital Data submissions.
April 2003	L.4 L_MT1_LOMC	Changed the description of the FIRM_PAN field so that it is not described as a foreign key.
April 2003	L.4 L_Node_Disch	Added the L_Node_Disch table.
April 2003	L.4 L_Pan_Revis	Added REVIS_ID field as primary key.
April 2003	L.4 L_Pan_Revis	Changed description of FIRM_PAN field so that it is not described as a primary key.
April 2003	L.4 L_Pol_FHBM	Changed the name of the COMM_NO field to CID to remain consistent with the S_Pol_Ar table.
April 2003	L.4 L_Pol_FHBM	Added FHBM_ID as a primary key.
April 2003	L.4 L_Pol_FHBM	Changed description of CID so that it is not described as a primary key.
April 2003	L.4 L_Regression	Added the L_Regression table.
April 2003	L.4 L_Riv_Model	Removed the L_Riv_Model table.
April 2003	L.4 L_Stn_Start	Clarified that multiple reaches can share the same entry.
April 2003	L.4 L_Stn_Start	Added a requirement to include units of measure in the start description.
April 2003	L.4 L_Stn_Start	Removed the SOURCE_CIT field.
April 2003	L.4 L_Storm_Curve	Added the L_Storm_Curve table.
April 2003	L.4 L_Storm_Info	Added the L_Storm_Info table.
April 2003	L.4 L_Subbas_Disch	Added the L_Subbas_Disch table.
April 2003	L.4 L_Wtr_Nm	Removed L_Cst_Model table and L_Riv_Model table from WTR_NM_LID field's description.
April 2003	L.4 L_XS_Ratings	Added the L_XS_Ratings table.
April 2003	L.4	Replaced the previous chart showing table structure in Microsoft Access with detailed table structure for Microsoft Access, Esri Shapefile, Esri Coverage and MapInfo table formats for all tables.



Date	Affected Section(s)	Summary of Change
April 2003	L.4	Removed acceptable domain values from this section and replaced them with detailed table structure for Microsoft Access, Esri Shapefile, Esri Coverage and MapInfo table formats. Added a new Section L.9 listing acceptable values for all standardized domains.
April 2003	L.4	Some domain tables had additional values added and typographic corrections made.
April 2003	L.4 D_Area_Units	Added the D_Area_Units table.
April 2003	L.4 D_CBRS_Typ	Corrected typographic error.
April 2003	L.4 D_Discharge_Units	Added the D_Discharge_Units table.
April 2003	L.4 D_Eros_Method	Added the D_Eros_Method table.
April 2003	L.4 D_Frequency	Added the D_Frequency table.
April 2003	L.4 D_Gage	Added the D_Gage table.
April 2003	L.4 D_Label_Typ	Corrected typographic error.
April 2003	L.4 D_Ln_Typ	Corrected typographic error.
April 2003	L.4 D_Ln_Typ	Capitalized 'pct' in LN_TYP field description and domain values.
April 2003	L.4 D_Ln_Typ	Added a discussion regarding the lines for SFHA boundaries.
April 2003	L.4 D_Ln_Typ	Added line type MEANDER to precedence for PLSS data.
April 2003	L.4 D_Method	Added the D_Method table.
April 2003	L.4 D_Nodes	Added the D_Nodes table.
April 2003	L.4 D_Runup_Mdl	Added the D_Runup_Mdl table.
April 2003	L.4 D_Shr_Rough	Added the D_Shr_Rough table.
April 2003	L.4 D_Shr_Typ	Added the D_Shr_Typ table.
April 2003	L.4 D_Storms	Added the D_Storms table.
April 2003	L.4 D_Surge_Mdl	Added the D_Surge_Mdl table.
April 2003	L.4 D_Time_Units	Added the D_Time_Units table.
April 2003	L.4 D_Trans_Typ	Added discussion on when the value undefined should be used.
April 2003	L.4 D_Units	Replaced with D_Length_Units.
April 2003	L.4 D_Velocity_Units	Added the D_Velocity_Units table.
April 2003	L.4 D_Volume_Units	Added the D_Volume_Units table.
April 2003	L.4 D_VZone	Added the D_VZone table.
April 2003	L.4 D_Water_Typ	Increased the width of the WATER_TYP field.
April 2003	L.4 D_Wave_Mdl	Added the D_Wave_Mdl table.
April 2003	L.4 D_Zone	Corrected typographic errors.
April 2003	L.4 D_Zone	Capitalized 'pct' in FLD_ZONE field description and domain values.
April 2003	L.5	Corrected typographic error.
April 2003	L.5	Added SID and PNG to list of raster data formats.
April 2003	L.6	Modified the metadata to be processed by mp with fewer errors.
April 2003	L.6	Removed "Right of ways" as a format for road data.
April 2003	L.6	Removed L_Riv_Model from the tables in the data set.
April 2003	L.6	Changed metadata file name.
April 2003	L.6	Added indents to clarify data structure relative to FGDC metadata standards.
April 2003	L.7 S_Base_Index	Corrected typographic error.
April 2003	L.7 S_BFE	Renamed UNITS field to LEN_UNIT.
April 2003	L.7 S_BFE	Corrected typographic error.
April 2003	L.7 S_CBRS	Changed CBRS_TYP and CBRS_DATE to required if applicable instead of required.
April 2003	L.7 S_CBRS	Expanded description of the CBRS_TF field.
April 2003	L.7 S_CBRS	Clarified description of the S_CBRS table.
April 2003	L.7 S_CBRS	Clarified description of the CBRS_DATE field.
April 2003	L.4 S_Cst_Gage	Added the S_Cst_Gage table.



Date	Affected Section(s)	Summary of Change
April 2003	L.7 S_Cst_Tsct_Ln	Removed CST_MDL_ID field.
April 2003	L.7 S_Cst_Tsct_Ln	Added Enhanced attributes.
April 2003	L.7 S_DOQ_Index	Renamed the S_DOQ_Index table to S_Base_Index.
April 2003	L.7 S_DOQ_Index	Renamed DOQ_ID field to BASE_ID.
April 2003	L.7 S_DOQ_Index	Renamed DOQ_DATE field to BASE_DATE.
April 2003	L.7 S_DOQ_Index	Changed references to orthophotos to the less restrictive description of raster base maps.
April 2003	L.7 S_FIRM_Pan	Changed the requirement for panels that extend past the administrative boundaries of the area mapped to extend out to the mapped panel neatlines rather than be clipped to the boundary of the area mapped.
April 2003	L.7 S_FIRM_Pan	Changed capitalization of PNP_REASON.
April 2003	L.7 S_Fld_Haz_Ar	Corrected typographic error.
April 2003	L.7 S_Fld_Haz_Ar	Capitalized 'pct' in FLD_ZONE field description.
April 2003	L.7 S_Fld_Haz_Ar	Expanded description of SFHA_TF field.
April 2003	L.7 S_Fld_Haz_Ar	Renamed UNITS field to LEN_UNIT.
April 2003	L.7 S_Fld_Haz_Ar	Clarified that the units field applies to depths as well as BFEs.
April 2003	L.7 S_Fld_Haz_Ar	Renamed VEL_UNITS to VEL_UNIT.
April 2003	L.7 S_Fld_Haz_Ar	Added a DEP_REVERT field to hold a depth value for AR zones that required depths for the reverted zone.
April 2003	L.7 S_Fld_Haz_Ar	Expanded discussion of SOURCE_CIT to say that the flood zones will be divided to track the sources of the most recent revision, but not previous revisions.
April 2003	L.7 S_Fld_Haz_Ar	Added Enhanced attributes.
April 2003	L.7 S_Fld_Haz_Ln	Corrected typographic error.
April 2003	L.7 S_Fld_Haz_Ln	Removed the SOURCE_CIT field.
April 2003	L.7 S_Label_Ld	Corrected typographic error.
April 2003	L.7 S_Label_Pt	Expanded description of DEGREES field.
April 2003	L.7 S_LOMR	Clarified that the polygon is the outline shown on the LOMR attachment.
April 2003	L.7 S_LOMR	Added Enhanced attributes.
April 2003	L.7 S_Nodes	Added the S_Nodes table.
April 2003	L.7 S_OvrbnkLn	Added the S_OvrbnkLn table.
April 2003	L.7 S_Perm_Bmk	Corrected typographic error.
April 2003	L.7 S_PFD_Ln	Added the S_PFD_Ln table.
April 2003	L.7 S_PLSS_Ar	Changed the requirements for PLSS data to be analogous to Transportation and Water features. Existing data used for a DFIRM is not required to be restructured to follow the DFIRM Database specification. The table is not required if the data used for the hard copy map is not available for free public distribution by FEMA.
April 2003	L.7 S_PLSS_Ar	Corrected typographic errors.
April 2003	L.7 S_PLSS_Ln	Changed the requirements for PLSS data to be analogous to Transportation and Water features. Existing data used for a DFIRM is not required to be restructured to follow the DFIRM Database specification. The table is not required if the data used for the hard copy map is not available for free public distribution by FEMA.
April 2003	L.7 S_PLSS_Ln	Corrected typographic errors.
April 2003	L.7 S_Pol_Ar	Fixed confusion between the COMM_NO and the CID fields. The CID field is the concatenation of the two digit State FIPs code and COMM_NO.
April 2003	L.7 S_Pol_Ar	Added text values to use for COMM_NO when local jurisdiction does not apply to an area.

Date	Affected Section(s)	Summary of Change
April 2003	L.7 S_Pol_Ar	Fixed capitalization of POL_NAME1 and POL_NAME2.
April 2003	L.7 S_Pol_Ar	Expanded description of ANI_TF field.
April 2003	L.7 S_Pol_Ar	Removed SOU_RCE_CIT field.
April 2003	L.7 S_Pol_Ar	Corrected typographic error.
April 2003	L.7 S_Precip_Gage	Added the S_Precip_Gage table.
April 2003	L.7 S_Profil_BasIn	Added the S_Profil_BasIn table.
April 2003	L.7 S_Quad	Renamed table S_Quad to S_Quad_Index.
April 2003	L.7 S_Shore_Ln	Added the S_Shore_Ln table.
April 2003	L.7 S_Stn_Start	Added the S_Stn_Start table.
April 2003	L.7 S_Subbasins	Added the S_Subbasins table.
April 2003	L.7 S_Trnsport_Ln	Changed references to orthophotos to the less restrictive description of raster base maps.
April 2003	L.7 S_Trnsport_Ln	Clarified that FEAT_NM1 should also be used for route numbers and "Intracoastal Waterway."
April 2003	L.7 S_Trnsport_Ln	Corrected typographic error.
April 2003	L.7 S_Water_Gage	Added the S_Water_Gage table.
April 2003	L.7 S_Wtr_Ar	Increased the width of the WATER_TYP field.
April 2003	L.7 S_Wtr_Ar	Changed references to orthophotos to the less restrictive description of raster base maps.
April 2003	L.7 S_Wtr_Ar	Changed reference to table name D_Wtr_Typ to D_Water_Typ.
April 2003	L.7 S_Wtr_Ln	Increased the width of the WATER_TYP field.
April 2003	L.7 S_Wtr_Ln	Changed references to orthophotos to the less restrictive description of raster base maps.
April 2003	L.7 S_Wtr_Ln	Changed reference to table name D_Wtr_Typ to D_Water_Typ.
April 2003	L.7 S_XS	Added fields for vertical datum and units that apply to the WSEL_100 field.
April 2003	L.7 S_XS	Removed field XS_NO.
April 2003	L.7 S_XS	Renamed WSEL_100 field to WSEL_REG.
April 2003	L.7 S_XS	Renamed UNITS field to LEN_UNIT.
April 2003	L.7 S_XS	Removed the RIV_MDL_ID field.
April 2003	L.7 S_XS	Fixed formatting error.
April 2003	L.7 S_XS	Clarified that XS_LTR can be either a letter or a number.
April 2003	L.7 S_XS	Added Enhanced attributes.
April 2003	L.7 Study_Info	Changed the STUDY_PRE field and JURIS_TYP field to required if applicable rather than required.
April 2003	L.7 Study_Info	Expanded description of OPP_TF field.
April 2003	L.7 Study_Info	Expanded description of CW_TF field.
April 2003	L.7 Study_Info	Expanded description of RTROFT_TF field.
April 2003	L.7 Study_Info	Added META_NM field.
April 2003	L.7 Study_Info	Removed UNITS from the matrix.
April 2003	L.7 Study_Info	Added Enhanced attributes.
April 2003	L.7 L_Aux_Data	Added the L_Aux_Data table.
April 2003	L.7 L_Case_Info	Added the L_Case_Info table.
April 2003	L.7 L_Cst_Model	Removed from Standard. Existing attributes and additional attributes were added as part of the Enhanced.
April 2003	L.7 L_Comm_Info	Clarified that all communities within the area of study are included in the table.
April 2003	L.7 L_Comm_Info	Changed REPOS_ADR2 to required if applicable rather than required.
April 2003	L.7 L_Comm_Info	Expanded description of REPOS_ST.
April 2003	L.7 L_Comm_Info	Expanded description of IN_ID_DAT field.
April 2003	L.7 L_Comm_Info	Expanded description of IN_NFIP_DT field.
April 2003	L.7 L_Comm_Info	Expanded description of IN_FRM_DAT field.
April 2003	L.7 L_Comm_Info	Expanded description of IN_RECENT_DAT field.

Date	Affected Section(s)	Summary of Change
April 2003	L.7 L_Hydra_Model	Added the L_Hydra_Model table.
April 2003	L.7 L_Hydro_Model	Added the L_Hydro_Model table.
April 2003	L.7 L_Media	Added the L_Media table.
April 2003	L.7 L_MT1_LOMC	Added a value of "redetermined" for LOMCs included in Draft Digital Data submissions.
April 2003	L.7 L_MT1_LOMC	Changed the description of the FIRM_PAN field so that it is not described as a foreign key.
April 2003	L.7 L_Node_Disch	Added the L_Node_Disch table.
April 2003	L.7 L_Pan_Revis	Added REVIS_ID field as primary key.
April 2003	L.7 L_Pan_Revis	Changed description of FIRM_PAN field so that it is not described as a primary key.
April 2003	L.7 L_Pol_FHBM	Changed the name of the COMM_NO field to CID to remain consistent with the S_Pol_Ar table.
April 2003	L.7 L_Pol_FHBM	Added FHBM_ID as a primary key.
April 2003	L.7 L_Pol_FHBM	Changed description of CID so that it is not described as a primary key.
April 2003	L.7 L_Regression	Added the L_Regression table.
April 2003	L.7 L_Riv_Model	Removed the L_Riv_Model table.
April 2003	L.7 L_Stn_Start	Clarified that multiple reaches can share the same entry.
April 2003	L.7 L_Stn_Start	Added a requirement to include units of measure in the start description.
April 2003	L.7 L_Stn_Start	Removed the SOURCE_CIT field.
April 2003	L.7 L_Storm_Curve	Added the L_Storm_Curve table.
April 2003	L.7 L_Storm_Info	Added the L_Storm_Info table.
April 2003	L.7 L_Subbas_Disch	Added the L_Subbas_Disch table.
April 2003	L.7 L_XS_Ratings	Added the L_XS_Ratings table.
April 2003	L.7	Replaced the previous chart showing table structure in Microsoft Access with detailed table structure for Microsoft Access, Esri Shapefile, Esri Coverage and MapInfo table formats for all tables.
April 2003	L.8	Modified the metadata to be processed by mp with fewer errors.
April 2003	L.8	Removed L_Riv_Model from the tables in the data set.
April 2003	L.8	Changed metadata file name.
April 2003	L.8	Added indents to clarify data structure relative to FGDC metadata standards.
April 2003	L.9	Added a new section, Section L.9, listing acceptable values for all standardized domains.
April 2003	L.9	Some domain tables had additional values added and typographic corrections made.
April 2003	L.9	Domain tables for the Enhanced attributes were added.
October 2011	1	Added information regarding the National Flood Hazard Layer (NFHL).
October 2011	3.2	Added requirements section.
October 2011	3.3	Added additional Source Citation Abbreviations.
October 2011	3.4	Inserted description of Appendix M relationship.
October 2011	3.4	Added placeholder for Risk Assessment database.
October 2011	3.5	Removed references to NGVD29 and NAD27.
October 2011	3.7	Added reference to DVT check documents and deleted 3.5.8 DVT minimum requirements.
October 2011	3.8	Deleted Geographic Markup Language (GML) requirement.
October 2011	3.8	Deleted requirement to submit ReadMe.txt.
October 2011	3.8	Added digital profile output files.

Date	Affected Section(s)	Summary of Change
October 2011	3.8	Added requirement to submit 11x17 Adobe PDF version of Index map.
October 2011	5	Added reference to metadata document.
October 2011	6	Added reference to domain table document.
October 2011	3.5.11	Removed reference to benchmarks.
October 2011	3.6.1	Added Physical Map Revision (PMR) section.
October 2011	3.6.10	Removed benchmarks and local control option.
October 2011	3.6.13	Deleted Geographic Markup Language (GML) requirement.
October 2011	3.6.2	Removed 25,000 vertices limitation.
October 2011	3.6.2	Added additional topology checks from the DFIRM Verification Tool (DVT) database.
October 2011	D_Area_Units	Added domain values "SQUARE MILES" and "SQUARE KILOMETERS."
October 2011	D_Basemap_Typ	Added new table to document.
October 2011	D_BeachSet	Added new table to document.
October 2011	D_Cert_Status	Added new table to document.
October 2011	D_Chan_Rep	Removed table.
October 2011	D_Cst_Struct	Added new table to document.
October 2011	D_Cst_Typ	Added new table to document.
October 2011	D_Discharge_Units	Removed domain values "GPD" and "GPM."
October 2011	D_Eros_Method	Removed table.
October 2011	D_Erosion	Added new table to document.
October 2011	D_Event	Added new table to document.
October 2011	D_Floodway	Removed table; domain values are now listed in D_ZONE_SUBTYPE.
October 2011	D_Font	Added new table to document.
October 2011	D_Frequency	Removed table.
October 2011	D_Gage	Removed table.
October 2011	D_Gage_Typ	Added new table to document.
October 2011	D_Horiz_Datum	Added new table to document.
October 2011	D_Hydra	Removed table.
October 2011	D_Hydro	Removed table.
October 2011	D_Intersect_Zone	Added new table to document.
October 2011	D_Jurisdiction_Typ	Added new table to document.
October 2011	D_Label_Typ	Added domain values "NOTES AND MAP COLLAR, S_BFE, S_CBRs, S_CST_TSCT_LN, S_FIRM_PAN, S_FLD_HAZ_AR, S_FLD_HAZ_LN, S_GAGE, S_GEN_STRUCT, S_LEVEE, S_LIMWA, S_PFD_LN, S_PLSS_AR, S_POL_AR, S_PROFIL_BASLN, S_RIV_MRK, S_TSCT_BASLN, and S_XS."
October 2011	D_Levee_Scenario	Added new table to document.
October 2011	D_Levee_Status	Added new table to document.
October 2011	D_Levee_Type	Added new table to document.
October 2011	D_Ln_Typ	Removed all values; Added domain values "SFHA/FLOOD ZONE BOUNDARY," "LIMIT OF DETAILED STUDY/LIMIT OF STUDY "OTHER BOUNDARY."
October 2011	D_Loc_Accuracy	Added new table to document.
October 2011	D_LOMC_Status	Added new table to document.
October 2011	D_Mtg_Typ	Added new table to document.
October 2011	D_Method	Added domain value "COMBO OF TOPO AND SURVEY."
October 2011	D_MTFCC	Added new table to document.
October 2011	D_Nm_Typ	Removed table.
October 2011	D_Node_Typ	Added new table to document.
October 2011	D_Nodes	Removed table.

Date	Affected Section(s)	Summary of Change
October 2011	D_Panel_Typ	Added domain values "STATEWIDE, PANEL PRINTED" and "STATEWIDE, NOT PRINTED."
October 2011	D_Prof_Basln_Typ	Added new table to document.
October 2011	D_Prof_Lbl_Adjust	Added new table to document.
October 2011	D_Prof_Lbl_Orient	Added new table to document.
October 2011	D_Proj_Unit	Added new table to document.
October 2011	D_Projection	Added new table to document.
October 2011	D_Quad_Corner	Added new table to document.
October 2011	D_Route_Typ	Added new table to document.
October 2011	D_Rd_Stat	Removed table.
October 2011	D_Runup_Mdl	Updated values to reflect newer models.
October 2011	D_Scale	Added domain value of 10000 for Puerto Rico.
October 2011	D_Shr_Rough	Removed table.
October 2011	D_Shr_Typ	Coded domain values changed.
October 2011	D_State_FIPS	Added new table to document.
October 2011	D_State_Name	Added new table to document.
October 2011	D_Storms	Removed table.
October 2011	D_Struct_Face	Added new table to document.
October 2011	D_Struct_Mtl	Added new table to document.
October 2011	D_Struct_Typ	Removed "CHANNEL CONTAINS 0.2 PCT FLOOD EVENT, CHANNEL CONTAINS 1 PCT FLOOD EVENT, CULVERT CONTAINS 0.2 PCT FLOOD EVENT, CULVERT CONTAINS 1 PCT FLOOD EVENT, FLOODWAY CONTAINED IN CHANNEL, and STRUCTURE CONTAINS 1 PCT FLOOD EVENT." Added "0.2 PCT ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN STRUCTURE, 1 PCT ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN STRUCTURE, CLOSURE STRUCTURE, FLOODWALL, FLOODWAY CONTAINED IN STRUCTURE, OTHER/MISC STRUCTURE, PIPELINE, RETAINING WALL, REVETMENT, SIPHON."
October 2011	D_Study_Prefix	Added new table to document.
October 2011	D_Study_Typ	Added new table to document.
October 2011	D_Surge_Mdl	Updated domain values to reflect newer models.
October 2011	D_Task_Typ	Added new table to document.
October 2011	D_Trans_Typ	Removed table.
October 2011	D_TrueFalse	Added new table to document.
October 2011	D_TsctBasln_Typ	Added new table to document.
October 2011	D_USACE_District	Added new table to document.
October 2011	D_V_Datum	Added values LOCAL TIDAL DATUM, MLLW and MLW.
October 2011	D_Volume_Units	Removed table.
October 2011	D_VZone	Removed 30 FOOT SPLASH ZONE BEHIND STRUCTURE, RUNUP EXTENT, and WHAFIS. Added BREAKING WAVE HT, HIGH VELOCITY FLOW, RUNUP, WAVE OVERTOPPING SPLASH ZONE.
October 2011	D_Water_Typ	Removed all values; Added domain values "AREA OF COMPLEX CHANNELS/OVERFLOWS, STREAM CENTERLINE, OPEN WATER AREA, WETLANDS, MANMADE WATER FEATURE, GLACIAL FEATURE, COASTLINE/ISLAND SHORELINE, and INTERMITTENT RIVER/STREAM/WASH"
October 2011	D_Wave_Mdl	Updated values to reflect newer models.
October 2011	D_XS_Ln_Typ	Added new table to document.
October 2011	D_Zone	Moved non-insurance rate zone domain values into D_ZONESUBTYPE.
October 2011	D_Zone_Subtype	Added all non-insurance rate zones and floodway options.
October 2011	Intro	Added section about reference to dynamic documents.
October 2011	L_Aux_Data	Removed table.

Date	Affected Section(s)	Summary of Change
October 2011	L_Case_Info	Removed table.
October 2011	L_Comm_Info	Added IN_FHBM_DT, FST_CW_EFF, FST_CW_FIS, REVISIONS, MULTICO_TF, FLOODPRONE, FIS_INCLUD, RECENT_FIS.
October 2011	L_Comm_Revis	Added new table to document.
October 2011	L_Cst_Model	Revised table description. Removed values "CASE_NO, SURGE_ZIP, WAVE_EFF, and WAVE_ZIP." Added values "HUC8, STUDY_TYP, LIMIT_FROM, LIMIT_TO, STRM_PRM, STM_PRM_DT, TDE_ST_MTH, TDE_ST_DAT, R_FTCH_MTH, R_FTCH_DAT, EROS_METH, EROS_DATE, WAVE_EFFDT, and HAZARDEVAL."
October 2011	L_Cst_Struct	Added new table to document.
October 2011	L_Hydra_Model	Removed table.
October 2011	L_Hydro_Model	Removed table.
October 2011	L_Media	Removed table.
October 2011	L_ManningsN	Added new table to document.
October 2011	L_Meetings	Added new table to document.
October 2011	L_MT1_LOMC	Removed table.
October 2011	L_MT2_LOMR	Added new table to document.
October 2011	L_Mtg_POC	Added new table to document.
October 2011	L_Node_Disch	Removed table.
October 2011	L_Profil_Bkwtr_El	Added new table to document needed for RASPLLOT integration.
October 2011	L_Profil_Label	Added new table to document needed for RASPLLOT integration.
October 2011	L_Regression	Removed table.
October 2011	L_Source_Cit	Added new table to document.
October 2011	L_Stn_Start	Removed table.
October 2011	L_Storm_Curve	Removed table.
October 2011	L_Storm_Info	Removed table.
October 2011	L_Subbas_Disch	Removed table.
October 2011	L_Summary_Discharges	Added new table to document.
October 2011	L_Summary_Elevations	Added new table to document.
October 2011	L_XS_Elev	Added new table to document.
October 2011	L_XS_Struct	Added new table to document needed for RASPLLOT integration.
October 2011	L_XS_Ratings	Removed table.
October 2011	S_Alluvial_Fan	Added new table to document.
October 2011	S_Base_Index	Expanded FILENAME field width to 128.
October 2011	S_BFE	Added business rules for BFE placement.
October 2011	S_BFE	Added language that S_BFE is only required for detailed studies without profiles and cross sections, FEMA Contracting officer decision.
October 2011	S_CBRS	Removed "CBRS_TF." Added value "WTR_NM."
October 2011	S_Cst_Gage	Added fields "END_TIME, V_DATUM, DATUM_CONV, TIDE_TF, TIDE_EPOCH, TIDE_VBM, WVSPEC_TF, and Wdstn_HT."
October 2011	S_Cst_Tsct_Ln	Removed "EFF_TF, SHOWN_FIRM, SHR_ROUGH, L_RANGE, L_DIRECT, R_RANGE, R_DIRECT" fields. Added "TBASELN_ID, WTR_NM, DATUM_CONV, CSTLN_TYP, BEACH_SET, EVENT_TYP, SWEL, FETCH_LEN, FTCHLNUNIT, LOC_DESC, LU_SOURCE, RUP, ELEV_UNIT, WHAFIS_TF, OVERTOP_TF, BW_HGT_TF, HVFLOW_TF, WAVE_02PCT" fields.
October 2011	S_Datum_Conv_Pt	Added new table to document.
October 2011	S_FIRM_Pan	Removed "NW_LAT, NW_LONG, SE_LAT, SE_LONG" fields. Added "BASE_TYP" field.

Date	Affected Section(s)	Summary of Change
October 2011	S_Fld_Haz_Ar	Removed "FLOODWAY, AR_REVERT, BFE_REVERT, DEP_REVERT" fields. Added "STUDY_TYP" field. Added ZONE_SUBTYP field to further define zone subtypes.
October 2011	S_Fld_Haz_Ln	Revised description to new usage. Added "SOURCE_CIT" field.
October 2011	S_Gage	Added new table to document.
October 2011	S_Gen_Struct	Updated table description. Added "CST_STRUCT, LOC_DESC, STRUC_DESC, SHOWN_FIRM" fields.
October 2011	S_HWM	Added new table to document.
October 2011	S_Hydro_Reach	Added new table to document.
October 2011	S_Label_Ld	Updated description to include all labels and notes.
October 2011	S_Label_Pt	Updated description to include all labels and notes. Added "LABEL2, FONT_SIZE, FONT_TYPE, FIRM_PAN, SCALE" fields.
October 2011	S_Levee	Added new table to document.
October 2011	S_LiMWA	Added new table to document.
October 2011	S_LOMR	Updated description to define NFHL and FIRM Database usage.
October 2011	S_Nodes	Added "NODE_TYP, WTR_NM, NODE_DESC, MODEL_ID" fields.
October 2011	S_Ovrbnkln	Removed table.
October 2011	S_Perm_Bmk	Removed table.
October 2011	S_PFD_Ln	Added "VZONE_LIMIT" field.
October 2011	S_PLSS_Ar	Added "NAME" field. Removed option to display PLSS as lines.
October 2011	S_PLSS_Ln	Removed table.
October 2011	S_Pol_Ar	Updated table description. Added "ANI_FIRM, SOURCE_CIT" fields.
October 2011	S_Pol_Ln	Removed table.
October 2011	S_Precip_Gage	Removed table.
October 2011	S_Profil_Basln	Updated table description. Removed "UP_NODE, DN_NODE, ROUTE_METH, SHOWN_FIRM" fields. Added "SEGMT_NAME, STUDY_TYP, INTER_ZONE, R_ST_DESC, R_END_DESC, V_DATM_OFF, LEN_UNIT, FLD_PROB1, FLD_PROB2, FLD_PROB3, SPEC_CONS1, SPEC_CONS2" fields. Updated naming convention for principal flood problem and special consideration files.
October 2011	S_Quad_Index	Removed table.
October 2011	S_Shore_Ln	Removed table.
October 2011	S_Stn_Start	Updated table description. Added "START_DESC, LOC_ACC" fields.
October 2011	S_Subbasins	Updated table description. Added "HUC8, WTR_NM, BASIN_DESC, SUB_AREA and AREA_UNIT" fields.
October 2011	S_Submittal_Info	Added new table to document.
October 2011	S_Tranport_Ln	Removed all fields. Updated table description. Added "TRANS_ID, MTFCC, FULLNAME, ALTNAME1, ALTNAME2, ROUTENUM, ROUTE_TYP, SOURCE_CIT" fields.
October 2011	S_Tsct_Basln	Added new table to document.
October 2011	S_Water_Gage	Removed table.
October 2011	S_Wtr_Ln	Removed "CHAN_REP" field.
October 2011	S_XS	Added business rules for cross section placement.
October 2011	S_XS	Removed "BED_ELEV, TOP_WIDTH, XS_AREA, AREA_UNIT, VELOCITY, VEL_UNIT" fields. Updated table description. Added "STRMBED_EL, PROF_XS_TEXT (for RASPLT integration)" fields.
October 2011	S_Zone_AR	Added new table to document.
October 2011	Study_Info	Removed "CBRS_REG, RTROFT_TF, STUDY_ZIP" fields. Expanded STUDY_NM, CNTY_NM and PROJECTION field width to 128. Added "PROJ_UNIT, PROJ_SECND, PROJ_SUNIT, LANDWD_VAL, FIS_NM, LOGO_NM, INDX_EFFDT, DBVRS_DT" fields.



Date	Affected Section(s)	Summary of Change
October 2011	throughout	Replaced usage of “DFIRM” with “FIRM” except for DFIRM_ID field. Added DFIRM_ID and VERSION_ID fields.
October 2011	title page	Updated title page.
October 2011	throughout	Changed precision of all DATE and DOUBLE fields to “Default”

# Table of Contents

L.1.	Flood Insurance Rate Map Database	Overview	[October 2011] .....	5
L.2.	Database Design Decisions		[October 2011] .....	13
L.2.1	Design Overview		[October 2011] .....	13
L.2.2	Spatial Data and Tabular Data		[October 2011] .....	13
L.3.	Preparation of Draft Digital Data		[October 2011] .....	15
L.4.	Preparation of Preliminary and Final Flood Insurance Rate Map Databases		[October 2011] .	15
L.4.1	General		[October 2011] .....	15
L.4.2	Requirements		[October 2011] .....	15
L.4.3	Data Source Coordination		[October 2011] .....	17
L.4.4	Standards		[October 2011] .....	18
L.4.5	Horizontal and Vertical Control		[October 2011] .....	19
L.4.6	Data Structure		[October 2011] .....	19
L.4.6.1	Tiling and Physical Map Revisions		[October 2011] .....	19
L.4.6.2	Topology		[October 2011] .....	20
L.4.6.3	Edgematching		[October 2011] .....	23
L.4.6.4	Digitizing Standards		[October 2011] .....	23
L.4.6.5	Vertex spacing		[October 2011] .....	24
L.4.6.6	PGDB Standards		[October 2011] .....	24
L.4.6.7	XY Tolerance for Geodatabases		[October 2011] .....	24
L.4.6.8	Coincident Features		[October 2011] .....	24
L.4.6.9	Feature Precision		[October 2011] .....	25
L.4.6.10	Data Compilation		[October 2011] .....	25
L.4.6.11	Relationship of Base Map to Flood Hazard Data		[October 2011] .....	25

L.4.6.12	Table Structure and Spatial Files	[October 2011]	26
L.4.7	Quality Control	[October 2011]	28
L.4.8	Deliverables	[October 2011]	29
L.4.9	Metadata	[October 2011]	29
L.5.	Database Table Structure Requirements for Draft Digital Data	[October 2011]	31
L.6.	Federal Emergency Management Agency Digital Mapping Information Checklist	[October 2011]	32
L.7.	Metadata Example for Draft Digital Data	[October 2011]	33
L.8.	Database Table Structure Requirements for Preliminary and Final Flood Insurance Rate Map Databases	[October 2011]	34
L.8.1	Table: S_Alluvial_Fan	[October 2011]	34
L.8.2	Table: S_Base_Index	[October 2011]	36
L.8.3	Table: S_BFE	[October 2011]	38
L.8.4	Table: S_CBRS	[October 2011]	40
L.8.5	Table: S_Cst_Gage	[October 2011]	42
L.8.6	Table: S_Cst_Tsct_Ln	[October 2011]	45
L.8.7	Table: S_Datum_Conv_Pt	[October 2011]	51
L.8.8	Table: S_FIRM_Pan	[October 2011]	53
L.8.9	Table: S_Fld_Haz_Ar	[October 2011]	55
L.8.10	Table: S_Fld_Haz_Ln	[October 2011]	58
L.8.11	Table: S_Gage	[October 2011]	59
L.8.12	Table: S_Gen_Struct	[October 2011]	61
L.8.13	Table: S_HWM	[October 2011]	63
L.8.14	Table: S_Hydro_Reach	[October 2011]	65
L.8.15	Table: S_Label_Ld	[October 2011]	66
L.8.16	Table: S_Label_Pt	[October 2011]	67

L.8.17	Table: S_Levee	[October 2011] .....	69
L.8.18	Table: S_LiMWA	[October 2011] .....	72
L.8.19	Table: S_LOMR	[October 2011] .....	73
L.8.20	Table: S_Nodes	[October 2011] .....	75
L.8.21	Table: S_PFD_Ln	[October 2011] .....	77
L.8.22	Table: S_PLSS_Ar	[October 2011] .....	78
L.8.23	Table: S_Pol_Ar	[October 2011] .....	80
L.8.24	Table: S_Profil_BasIn	[October 2011] .....	83
L.8.25	Table: S_Riv_Mrk	[October 2011] .....	86
L.8.26	Table: S_Stn_Start	[October 2011] .....	87
L.8.27	Table: S_Subbasins	[October 2011] .....	89
L.8.28	Table: S_Submittal_Info	[October 2011] .....	91
L.8.29	Table: S_Trnsport_Ln	[October 2011] .....	94
L.8.30	Table: S_Tsct_BasIn	[October 2011] .....	96
L.8.31	Table: S_Wtr_Ar	[October 2011] .....	98
L.8.32	Table: S_Wtr_Ln	[October 2011] .....	100
L.8.33	Table: S_XS	[October 2011] .....	102
L.8.34	Table: S_Zone_AR	[October 2011] .....	105
L.8.35	Table: Study_Info	[October 2011] .....	106
L.8.36	Table: L_Comm_Info	[October 2011] .....	110
L.8.37	Table: L_Comm_Revis	[October 2011] .....	113
L.8.38	Table: L_Cst_Model	[October 2011] .....	114
L.8.39	Table: L_Cst_Struct	[October 2011] .....	118
L.8.40	Table L_Cst_Tsct_Elev	[October 2011] .....	120
L.8.41	Table: L_ManningsN	[October 2011] .....	121

L.8.42	Table: L_Meetings	[October 2011].....	122
L.8.43	Table: L_MT2_LOMR	[October 2011] .....	123
L.8.44	Table: L_Mtg_POC	[October 2011] .....	125
L.8.45	Table: L_Pan_Revis	[October 2011] .....	127
L.8.46	Table: L_Pol_FHBM	[October 2011] .....	129
L.8.47	Table: L_Profil_Bkwtr_El	[October 2011] .....	130
L.8.48	Table: L_Profil_Label	[October 2011] .....	131
L.8.49	Table: L_Source_Cit	[October 2011] .....	133
L.8.50	Table: L_Summary_Discharges	[October 2011] .....	135
L.8.51	Table: L_Summary_Elevations	[October 2011] .....	137
L.8.52	Table: L_XS_Elev	[October 2011] .....	139
L.8.53	Table: L_XS_Struct	[October 2011] .....	144
L.9.	Metadata Example for Preliminary and Final Flood Insurance Rate Map Databases	[October 2011]	146
L.10.	Domain Tables	[October 2011] .....	147

# Appendix L

## Digital Data and Flood Insurance Rate Map Database Standards

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The purpose of this Appendix is to provide guidance and standards to the mapping partner that prepares the Preliminary and Final Flood Insurance Rate Map (FIRM) databases delivered to the Federal Emergency Management Agency (FEMA). For a particular flood risk project, the FEMA Project Officer may assign both tasks to one mapping partner or each task (i.e., the Preliminary FIRM Database or the Final FIRM Database) to a different mapping partner. This Appendix is not intended to specify in-process compilation or digitizing procedures, but to present standards and requirements for outputs and deliverables.

Although occasional guidance (or best practices) have been included where necessary throughout this Appendix, the majority of the content in this Appendix represent standards to be used in preparing the Preliminary and Final FIRM Databases.

Due to the dynamic nature of some aspects of digital Geographic Information System (GIS) data, certain requirements are specified in documents outside of the *Guidelines and Standards for Flood Risk Analysis and Mapping (Guidelines and Standards)*. The following documents are referenced in this Appendix:

- *DFIRM Verification Tool (DVT) – Topology Verification Guidelines*
- *Guidelines and Standards for Flood Risk Analysis and Mapping – Domain Tables Guide*
- *FEMA NFIP Metadata Profile for Draft, Preliminary and Final DFIRM Datasets*

The most current version of these documents can be obtained from the FEMA website at <http://msc.fema.gov>.

### L.1. Flood Insurance Rate Map Database Overview

#### [October 2011]

The FEMA FIRM Database will store the digital GIS data used in the map production process, as well as tabular information inside the Flood Insurance Study (FIS) report. The database will provide a standard, systematic method for FEMA to distribute comprehensive details of flood hazard identification studies to the public and others in a digital format.

Preparing the data in digital format has significant advantages. Digital data allow for a more efficient storage, update, search, and distribution of records. The most significant advantage is that the data are designed to work within a GIS environment. This means that the FIRM Database can be used for automated analyses and used with other readily available GIS, Computer Aided Drafting (CAD), and tabular data in order to increase the understanding and mitigation of flood risk. In addition, the FEMA

FIRM Database can be used as an outreach tool and be widely disseminated over the Internet through web applications and interfaces.

FEMA will collect as much data as possible in digital format, and archive the data in the GIS database created for each FIRM. The FIRM Database was designed to present the effective flood hazard information published by FEMA and store all of the available FIS report information. Users who need to know whether a structure is in or out of the Special Flood Hazard Area (SFHA), or the 1-percent-annual-chance flood elevation for a location will be able to use the FIRM Database to ascertain this information. FIRM Databases, once effective, will be incorporated into the National Flood Hazard Layer (NFHL). The NFHL is a nationwide database that serves as a repository for all effective digital flood hazard information from FEMA. This Appendix includes the standards for the FIRM Database and the NFHL. The FIRM Database is a static product, while the NFHL is a dynamic product, which can change whenever Letters of Map Revision (LOMRs) become effective (without corresponding updates to the published FIRM panels).

All of the tables in the FIRM Database are required if they apply to the FIRM or FIS report being created. Some tables, like those that depict coastal features, do not apply to every FIRM. The mapping partner that creates the FIRM shall ensure that all of the applicable tables in the FIRM Database have been completed and documented in the metadata. Generally, the FIRM Database will cover the entire jurisdiction, with either community- or countywide coverage. Appendix L does not directly address watershed-based updates to the FIRM Database. Updates to the FIRM Database will be performed via panel-based Physical Map Revisions (PMRs). These updates will be incorporated into the existing FIRM Database of the affected jurisdictions. Detailed standards for the Preliminary or Final FIRM Database are provided in Section L.8. A summary of the FIRM Database tables is provided in Table L-1.

**L-1. FIRM Database Table Summary**

FIRM Table Name	Table Type	Table Description
S_Alluvial_Fan	Spatial	Location and attributes of alluvial fan studies.
S_Base_Index	Spatial	Location and attributes of the raster base map files used for the FIRM.
S_BFE	Spatial	Location and attributes for Base Flood Elevations lines shown on FIRM.
S_CBRS	Spatial	Location and attributes for Coastal Barrier Resource System units on the FIRM.
S_Cst_Gage	Spatial	Location and attributes of coastal gages.
S_Cst_Tsct_Ln	Spatial	Location and attributes for coastal transect lines shown on the FIRM.
S_Datum_Conv_Pt	Spatial	Information regarding the location of points used to determine the datum conversion factor performed as part of this flood risk project.
S_FIRM_Pan	Spatial	Location and attributes for FIRM hardcopy map panels.
S_Fld_Haz_Ar	Spatial	Location and attributes for flood insurance risk zones on the FIRM.



FIRM Table Name	Table Type	Table Description
S_Fld_Haz_Ln	Spatial	Location and attributes for boundaries of flood insurance risk zones on the FIRM.
S_Gage	Spatial	Information about gage locations used in this flood risk project.
S_Gen_Struct	Spatial	Location and attributes for flood control structures shown on the flood profile and FIRM.
S_HWM	Spatial	Location of high water marks.
S_Hydro_Reach	Spatial	Location of hydrologic reach between nodes.
S_Label_Ld	Spatial	Location and attributes for label leader lines shown on the FIRM.
S_Label_Pt	Spatial	Location and attributes for labels shown on the FIRM.
S_Levee	Spatial	Location of levee centerlines, floodwalls, and closure structures protecting accredited and provisionally accredited levees.
S_LiMWA	Spatial	Location of Limit of Moderate Wave Action boundary.
S_LOMR	Spatial	Location and attributes for LOMRs not yet incorporated on the FIRM. Used only as part of the National Flood Hazard Layer (NFHL).
S_Nodes	Spatial	Location and attributes of points used to define the topology of the hydrologic network.
S_PFD_Ln	Spatial	Location and attributes for the primary frontal dune features for the coastal flood risk project area.
S_PLSS_Ar	Spatial	Location and attributes of sections, townships, and ranges on the FIRM.
S_Pol_Ar	Spatial	Location and attributes for political jurisdictions shown on the FIRM.
S_Profil_BasLn	Spatial	Location and attributes for profile baseline and stream centerline features for the flood risk project area.
S_Riv_Mrk	Spatial	Location and attributes for river mile markers shown on the FIRM.
S_Stn_Start	Spatial	Location and attributes for starting points for stream distance measurements.
S_Subbasins	Spatial	Location and attributes for subbasins in the hydrologic analysis.
S_Submittal_Info	Spatial	Location of areas updated in this flood risk project along with attributes associated with each submittal.
S_Trnsport_Ln	Spatial	Location and attributes for roads, railroads, and other transportation features shown on the FIRM.
S_Tsct_BasLn	Spatial	Location of mapped coastal transect baselines and associated attribute information.

FIRM Table Name	Table Type	Table Description
S_Wtr_Ar	Spatial	Location and attributes for hydrography features shown on FIRM as areas.
S_Wtr_Ln	Spatial	Location and attributes for hydrography features shown on FIRM as lines.
S_XS	Spatial	Location and attributes for cross section lines in the area covered by the FIRM. This layer must contain all cross sections in a model, not just the lettered cross sections.
S_Zone_AR	Spatial	Location and attributes of areas shown as Zone AR on the FIRM.
Study_Info	Non-Spatial	General information about the FIRM.
L_Comm_Info	Lookup	Information about each community on the FIRM.
L_Cst_Model	Lookup	Information about the coastal model used during the engineering analysis. It is used to create the respective table(s) in the FIS report text.
L_Cst_Struct	Lookup	Information about coastal structures that affect local topography and flood hazards. It is used to create the respective table(s) in the FIS report text.
L_Cst_Tsct_Elev	Lookup	Information about the coastal model elevations at each mapped transect and those transects referenced in the FIS report.
L_ManningsN	Lookup	Information regarding Manning's "n" values shown in the FIS report.
L_Meetings	Lookup	Information regarding the scoping and final community meetings that occur during the flood risk project. It is used to create the respective table(s) in the FIS report text.
L_MT2_LOMR	Lookup	Information regarding LOMRs incorporated into or superseded by the FIRM. It is used to create the respective table(s) in the FIS report text.
L_Mtg_POC	Lookup	Information regarding the scoping and final community meetings that occur during the flood risk project. It is used to create the respective table(s) in the FIS report text.
L_Pan_Revis	Lookup	Information about revisions to each FIRM panel.
L_Pol_FHBM	Lookup	Information listing communities that have ever had revisions to their historic FHBM maps.
L_Profil_Bkwtr_EI	Lookup	Information about the backwater elevations for each flood frequency by stream. Required if and when the data can be exported from RASPLOT in Appendix L format.

FIRM Table Name	Table Type	Table Description
L_Profil_Label	Lookup	This table stores the labels needed for FIS profiles by stream when the labels are not associated with specific cross sections or structures. Required if and when the data can be exported from RASPLOT in Appendix L format.
L_Source_Cit	Lookup	Listing and description of the sources of information used in the FIRM or referenced in the FIS report bibliography.
L_Summary_Discharges	Lookup	Information about the hydrologic discharge information associated with nodes referenced in the FIS report Summary of Discharges table.
L_Summary_Elevations	Lookup	Information about Special Flood Hazard Areas with static elevations that are referenced in the FIS report Summary of Elevations table.
L_XS_Elev	Lookup	Information about the hydraulic model at each mapped cross section and those cross sections referenced in the FIS report Floodway Data Tables. This table is used to generate the Floodway Data Tables and contains lettered cross sections.
L_XS_Struct	Lookup	Information about the cross sections at structures needed for the profiles.

Mapping partners will often only submit data that cover the geographic area of their work. The tables that are applicable to a specific flood risk project will vary, depending on the specific scope of that activity. Table L-2 presents the FIRM Database tables that apply to specific components of a flood risk project. The scope of a particular project could include several of these activities; therefore, all of the tables from each of the activities involved in the project will likely apply to that project. Most flood risk projects will include the requirement of a digital base map that meets the minimum requirements outlined in *Volume 1* and *Appendix K* of the *Guidelines and Standards*. Any variances will be approved by the FEMA Project Officer and documented in the appropriate metadata file.

Table L-2. Mapping Partner Database Submittal Table

The following FIRM Database tables are either R – Required, or A – Required if Applicable, depending on the interim data development submittal requirements. These tables need to be submitted to FEMA via the Mapping Information Platform (MIP) workflow at the corresponding MIP step.

FIRM Table Name	Acquire Base Map (DCS)	Develop Topographic Data (DCS)	Perform Hydrologic Analyses (approx. and detailed) (DCS)	Perform Hydraulic Analyses (approx. and detailed) (DCS)	Perform Floodplain Mapping (DCS)	Perform Coastal Analyses (DCS)	Perform Alluvial Fan Analysis (DCS)	Develop DFIRM Database	FIS Database Component	Components Shared with Appendix M (DCS) Database
S_Alluvial_Fan					A		R	A	A	✓
S_Base_Index	A							A		
S_BFE					A			A		✓
S_CBRS						A		A	A	✓
S_Cst_Gage					A	R		A	A	✓
S_Cst_Tsct_Ln					A	R		A	A	✓
S_Datum_Conv_Pt	A							A	A	✓
S_FIRM_Pan	R							R	R	✓
S_Fld_Haz_Ar				R	R	R		R	R	✓
S_Fld_Haz_Ln								R	R	
S_Gage			R					R	A	✓
S_Gen_Struct	R			R		R		A	R	✓
S_HWM				A				R	A	✓
S_Hydro_Reach			R					A		✓
S_Label_Ld								R		
S_Label_Pt								A		
S_Levee				A	A	A		A	A	✓
S_LiMWA						R		A	A	✓
S_LOMR										NFHL Only
S_Nodes			R					A	A	✓
S_PFD_Ln					A	R		A		✓
S_PLSS_AR	A							R		
S_Pol_Ar	R							R	A	

## Appendix L

FIRM Table Name	Acquire Base Map (DCS)	Develop Topographic Data (DCS)	Perform Hydrologic Analyses (approx. and detailed) (DCS)	Perform Hydraulic Analyses (approx. and detailed) (DCS)	Perform Floodplain Mapping (DCS)	Perform Coastal Analyses (DCS)	Perform Alluvial Fan Analysis (DCS)	Develop DFIRM Database	FIS Database Component	Components Shared with Appendix M (DCS) Database
S_Profil_Basln				R	A		R	A	A	✓
S_Riv_Mrk								A	A	✓
S_Stn_Start				R				R	A	✓
S_Subbasins			R		A			R	A	✓
S_Submittal_Info	R	R	R	R	R	R	R	R	R	✓
S_Trnsport_Ln	R							A		✓
S_Tsct_Basln					A	R		A	A	✓
S_Wtr_Ar	A							A		
S_Wtr_Ln	R							R		
S_XS				A	A		R	A	A	✓
S_Zone_AR				A	A			A		✓
Study_Info								R	R	
L_Comm_Info								R	R	
L_Cst_Model						R		A	A	✓
L_Cst_Struct						R		A	A	✓
L_Cst_Tsct_Elev						R		A	A	✓
L_ManningsN				A				A	A	✓
L_Meetings								A	R	
L_MT2_LOMR								R	R	
L_Mtg_POC								R	R	
L_Pan_Revis								A	R	
L_Pol_FHBM								R	A	
L_Profil_Bkwtr_El				A				A	A	✓
L_Profil_Label				A				A	A	✓
L_Source_Cit	R	R	R	R	R	R	R	R	R	✓
L_Summary_Discharges			R					A	A	✓
L_Summary_Elevations			R			R		A	A	✓

FIRM Table Name	Acquire Base Map (DCS)	Develop Topographic Data (DCS)	Perform Hydrologic Analyses (approx. and detailed) (DCS)	Perform Hydraulic Analyses (approx. and detailed) (DCS)	Perform Floodplain Mapping (DCS)	Perform Coastal Analyses (DCS)	Perform Alluvial Fan Analysis (DCS)	Develop DFIRM Database	FIS Database Component	Components Shared with Appendix M (DCS) Database
L_XS_Elev				R			R	A	A	✓
L_XS_Struct				A	A		A	A	A	✓

## L.2. Database Design Decisions

[October 2011]

### L.2.1 Design Overview

[October 2011]

To make the FIRM Database easier to use, FEMA will avoid the use of abbreviations and codes in the published data where feasible.

Where possible, all mapping and engineering data elements will be linked to physical geographic features that are georeferenced. A GIS has the ability to precisely overlay the mapping and engineering data. This approach supports a wide variety of existing and visionary FEMA engineering and mapping products, such as digital mapping, automated hydrologic and hydraulic modeling, automated mapping, web-based publishing, and direct links between modeling and mapping elements.

The layers and tables within the FIRM Database contain the information needed to create the map panels and FIS report. They are designed to allow a GIS user access to all of the information conveyed on the FIRM in a way that can take advantage of the automated analysis capabilities of GIS. FEMA will provide a companion product in the form of a scanned or raster image of the hardcopy FIRM that will allow users to reprint exact replicas of the whole FIRM or portions of the FIRM.

The FIRM Database is designed to be usable in a standard Relational Database Management System (RDBMS), but it will be software independent. Therefore, the products are defined as flat tables in public domain formats (e.g., Esri Personal Geodatabase and Esri Shapefiles). Users can import these formats into a wide variety of software packages. These file formats manage GIS data in discrete files, generally organized by data theme.

### L.2.2 Spatial Data and Tabular Data

[October 2011]

The complete FIRM Database product is a GIS database made up of spatial data describing the location of features on the earth and tabular data that describe the attributes of these spatial features. The tables described in Section L.8 that begin with “S\_” have a spatial component associated with them. The tables described in the following sections that begin with “L\_” are tabular (often referred to as a “lookup” or business table); there is no direct spatial component.

Domain tables (tables that begin with D\_) were established to assist FEMA’s mapping partners in the creation of the FIRM Database. These domain tables provide the mapping partner with valid or preferred attribute values for specific fields. A domain table also helps minimize entry differences by standardizing the value. For example, without domain tables, one user might enter “FLOODWAY” while another user might enter “FLDWY” while completing the ZONE\_SUBTY field in the S\_Fld\_Haz\_Ar table. While both of these entries reflect the same idea, the inconsistency between the two forms makes it difficult to group similar features. Using a domain table ensures that both users enter the same value to describe the same feature. To capture local characteristics not included in the domain table, mapping partners also may add and use their own values in the domain table (e.g., a more restrictive locally regulated floodway could be added to the accepted domain values as “Local Floodway”); additional domain table values must be approved by FEMA before they may be used in the flood risk project. The domains utilized by this



Appendix are identified in the *Guidelines and Standards for Flood Risk Analysis and Mapping Domain Tables Guide*.

To facilitate the submittal of digital flood hazard mapping data from all mapping partners, FEMA has established requirements for submitting FIRM digital data. Mapping partners preparing Preliminary or Final FIRM Databases must follow the format described in Section L.8.

## L.3. Preparation of Draft Digital Data [October 2011]

This section has been removed from this version of *Appendix L* [October 2011]. Please refer to the previous version [April 2003].

## L.4. Preparation of Preliminary and Final Flood Insurance Rate Map Databases [October 2011]

### L.4.1 General [October 2011]

Preliminary or Final FIRM Databases created by mapping partners must be consistent in file structure and in data format. The mapping partner that produces the Preliminary or Final FIRM also must ensure that the Preliminary or Final FIRM Database meets FEMA standards and is delivered to the FEMA Map Service Center (MSC) in the proper formats, as specified in the *MSC Deliverable Guide*.

The main issues that the assigned mapping partner shall consider in the preparation of the digital data are: Data Source Coordination, Standards, Horizontal and Vertical Control, Data Structure, Quality Control, Deliverable Format, and Metadata.

### L.4.2 Requirements [October 2011]

This section summarizes FEMA's requirements for FIRM Databases. These requirements are further defined in the subsequent sections, with additional guidance to help mapping partners understand and comply with these requirements. The requirements listed below are not necessarily applicable for every flood risk project but are functions of the level of the flood risk project, the extent of the flood risk project, and the available data. The following requirements are generally listed in the order they are discussed in subsequent sections:

- As specified in *Volume 1*, Section 1.3 and *Appendix I* of the *Guidelines and Standards*, a mapping partner must perform initial research to avoid the duplication of effort during a flood risk project. Data sources must be documented with Source Citations in the database and the metadata. See Section L.4.3 for additional information and guidance.
- Maps and spatial data used for flood hazard analyses, floodplain boundary delineations, and FIRM compilation must meet all requirements specified in this Appendix. Tables must be populated from data files submitted in compliance with *Appendix M* of the *Guidelines and Standards*, where specified. See Section L.4.4 for additional information and guidance.
- The preferred projection, coordinate system, horizontal datum, and horizontal units for the Preliminary or Final FIRM Database spatial data is the Universal Transverse Mercator (UTM) projection and coordinate system horizontally referenced to the North American Datum of 1983 (NAD83) datum, referenced in meters, although State Plane and State Plane HARN are other acceptable options. Vertical information must be referenced to the North American Vertical Datum of 1988 (NAVD88), referenced in feet. Vertical and horizontal datum must not be mixed

within a flood risk project or FIRM Database. For example, all feature classes in a FIRM Database must share the same horizontal coordinate system, and all feature classes with vertical attributes must be referenced in the same vertical coordinate system. See Section L.4.5 for additional information and guidance.

- The mapping partner must follow the data structure standards established in this Appendix:
  - The mapping partner must submit the digital data in a series of thematic files that cover the entire geographic area being mapped and not in individual small tiles that cover limited geographic areas. For partial countywide updates, the data must be clipped to the nearest panel or county boundary. See Section L.4.6.1 for additional information and guidance.
  - A horizontal cluster tolerance of no less than 0.25 feet (0.0762 meters) must be specified for the database. Vector data must meet the data structure requirements and follow the topology rules established in this Appendix. See Section L.4.6.2 for additional information and guidance.
  - The mapping partner must ensure that all submitted digital data are tied into any existing digital data files, so that a seamless transition is affected. Obtaining the most recent version of the NFHL and periodically checking for updates to adjacent data are the first steps for any edge-matching procedure. Disconnects, jogs, missing features, and different representation of features must be avoided. See Section L.4.6.3 for additional information and guidance.
  - Vertex Spacing. See Section L.4.6.5 for additional information and guidance.
  - Esri Personal Geodatabase (PGDB) Specifications. See Section L.4.6.6 for additional information and guidance.
  - XY Tolerance for geodatabases. See Section L.4.6.7 for additional information and guidance.
  - Coincident features exist in the S\_Fld\_Haz\_Ar and S\_Fld\_Haz\_Ln tables. The spatial elements that make up these features must be identical. See Section L.4.6.8 for additional information and guidance.
  - The position of horizontal control features of the FIRM products will be based on published standards. These are U.S. Geological Survey 7.5-minute series quadrangle map corner coordinates or the Coordinate grid. See Section L.4.6.9 for additional information and guidance.
  - In general, the most accurate data source must be relied upon to reference other features compiled onto the map. If this policy creates significant visual problems with the floodplain boundary delineations on the base map selected, the mapping partner shall resolve the issue with the FEMA Project Officer. See Section L.4.6.10 for additional information and guidance.
  - The mapping partner must ensure that all FIRM Database files conform to the required standards. See Section L.4.6.11 for additional information and guidance.
  - The mapping partner must follow the attribute table structure presented in Section L.8. The attribute data must be stored directly in the Esri Shapefile (SHP) and Esri PGDB version 9.3 or newer, along with the associated spatial data. The attribute data must not be in an independent data file or relational database format with the exception of DBF

files for lookup tables. All of the submitted GIS layers and tables must be in the same GIS file format. See Section L.4.6.12 for additional information and guidance.

- The digital files must be structured following the FIRM Database schema. This allows easy exchange of these data between FEMA, mapping partners, and other flood hazard data users. All duplicated elements must be removed. The data must be horizontally controlled and referenced to the appropriate horizontal and vertical datum. All digitizing must be done carefully and in conformance with FEMA's accuracy standards. The assigned mapping partner must perform a thorough Quality Control (QC) review before submitting data to FEMA. FEMA will review the data provided by the mapping partner using automated and interactive techniques. See Section L.4.7 for additional information and guidance.
- A complete FIRM Database submittal to the MSC is required and will comprise the items listed below. See Section L.4.8 for additional information and guidance.
  - FIRM Database files in Esri PGDB version 9.3 or newer, and Esri SHP format
  - Digital georeferenced PNG or TIF files of all FIRM panels that comply with the mapping standards listed in *Appendix K* of the Guidelines and Standards.
  - Digital orthophotography base map files, if applicable
  - Metadata file in accordance with FEMA NFIP Metadata Profile for Draft, Preliminary and Final DFIRM Datasets
  - PDF version of the FIS report with bookmarks for the section heading and profiles
  - PDF and georeferenced PNG version of FIRM Panel Index map in 11x17 format
  - Digital DWG, DXF or RASLOT MDB output files for all profiles in the FIS report

### L.4.3 Data Source Coordination

[October 2011]

The assigned mapping partner shall identify and use existing digital data whenever possible, while still meeting the required standards and quality of work.

As part of the initial coordination effort, the mapping partner that produces the digital flood risk project components shall identify available digital data and obtain datasets as necessary for flood risk project areas. This identification occurs during the Project Discovery phase of the project. Potential sources of digital base map or floodplain boundary data may be State, county, or local government agencies responsible for GIS, planning agencies or real estate assessment agencies. Digital floodplain data also may be available from FEMA, if the area has been previously converted to digital format. The requirements for project discovery and base maps are specified in *Volume I*, Section 1.4.3.1; *Appendix I*; *Appendix K*; and *Appendix M* of the *Guidelines and Standards*.

As part of data collection, coordination and submittal, the mapping partner that produces the FIRM Database must provide metadata that documents the data sources, date of collection or digitizing, scale of digitizing, projections, coordinate systems, horizontal datum, vertical datum, and units of all digital data used and submitted. The FIRM Database FGDC-compliant metadata file is used to store this information, and is submitted with the FIRM Database. For each data source used, the mapping partner shall add a record to the L\_Source\_Cit table described herein, and add a corresponding Source Citation entry to the FIRM Database metadata file in the Lineage section under Data Quality. Within the metadata file, the mapping partner shall assign each data source a Source Citation Abbreviation. These abbreviations are presented in Table L-3.

Table L-3. Source Citation Abbreviations

Source Citation Abbreviation	Use
BASE	For all base map sources (includes digital orthophotography, roads, railroads, airports, hydrography, and political boundaries)
FIRM	For features extracted from the existing FIRM
FHBM	For features extracted from the existing Flood Hazard Boundary Map (FHBM)
FBFM	For features extracted from the existing Flood Boundary and Floodway Map (FBFM)
LOMC	For information derived from a Letter of Map Change (LOMC)
FIS	For information taken from a previously published FIS report, including Floodway Data Tables and Flood Profiles
STUDY	For information developed for the current flood risk project
TSDN	For any information taken from the Technical Support Data Notebook (TSDN) (used for existing backup information in FEMA's archives not published on previous FIRM)
REF	For any other reference material listed in the FIS Bibliography Table not covered by one of the Source Citation types listed above.

The mapping partner that produces the FIRM Database shall number each source citation abbreviation for a distinct data source (e.g., BASE1, BASE2, and BASE3). All spatial tables in the standards discussed in Section L.8 have a SOURCE\_CIT field tied to values in the L\_Source\_Cit lookup table. The mapping partner that produces the FIRM Database shall populate the field with the Source Citation Abbreviation from the lookup table that applies to the related spatial feature. These L\_Source\_Cit field abbreviations are associated with documented source descriptions in the corresponding metadata files.

For PMRs in areas where digital FIRMs already exist, source citations in L\_Source\_Cit shall start with the next available number. For example, a FIRM Database with STUDY1 as the highest numbered flood risk project record would get a new record coded "STUDY2." Unmodified areas on this panel would remain coded STUDY1. The boundary between STUDY1 and STUDY2 areas shall be coded in S\_FLD\_HAZ\_LN with the line type OTHER BOUNDARY from the D\_LN\_TYP table.

Information on the preparation of FIRM Database metadata can be found in the latest *FEMA NFIP Metadata Profile Guidelines* and in *FEMA NFIP Metadata Profile for Draft, Preliminary and Final DFIRM Datasets*.

#### L.4.4 Standards

[October 2011]

The assigned mapping partner shall obtain or create these materials and submit them to FEMA, and shall ensure that the accuracy of the data in the submitted files, at a minimum, meets or exceeds FEMA's base map and FIS report information standards. The requirements for the flood hazard analyses, floodplain boundary delineations, and the base map are detailed in *Volume 1*, Section 1.4, *Appendix A*, and *Appendix M* of the *Guidelines and Standards*, respectively. FIS report standards are located in *Appendix J* of the *Guidelines and Standards* and *Procedure Memorandum No. 66*.

When possible, tables required by this Appendix shall be populated from the DCS (*Appendix M*)-compliant tables submitted to the MIP throughout the data development phase of flood risk projects. Table L-2 provides an overview of tables that must be carried over from DCS-compliant submittals at each data development step. If data are available from DCS-compliant data submittals to the MIP, this information must be used and incorporated into the FIRM Database in order to maximize quality and cost savings, and eliminate redundancy.

### L.4.5 Horizontal and Vertical Control [October 2011]

The preferred projection, coordinate system and horizontal datum for the Preliminary or Final FIRM Database spatial data is the UTM projection and coordinate system referenced to NAD83 meters. The data may also be in a State Plane coordinate system and associated projection, referenced to NAD83 feet if there are compelling reasons (e.g., project base map is in State Plane coordinates). The mapping partner shall obtain approval from the FEMA Project Officer in advance for variations to these two options. See *Appendix A* of the *Guidelines and Standards* for a discussion of horizontal datum and *Volume 1*, Subsection 1.4.3.2 for a discussion of raster base maps in other projections and coordinate systems.

In the event that the county or other jurisdiction being mapped lies in more than one projection and coordinate system zone, the assigned mapping partner shall ensure that all digital data submitted are projected in the zone that contains the largest portion of the jurisdiction in a single zone. The assigned mapping partner shall not use multiple State Plane or UTM zones within a single submittal. The assigned mapping partner may compile data in another zone, particularly if this facilitates higher positional accuracy of the data, re-project the data to the chosen zone for the jurisdiction being mapped, and merge the re-projected data with the rest of the data. The assigned mapping partner shall compile all horizontal information on NAD83, Geodetic Reference System 1980 (GRS 80) ellipsoid or revisions thereof. However, it is critical that the horizontal datum not be mixed within a flood risk project. See *Appendix A* of the *Guidelines and Standards* for details on horizontal datum requirements.

The assigned mapping partner shall reference all vertical information to the NAVD88. The mapping partner must not mix vertical datum within a flood risk project. See *Appendix B* of the *Guidelines and Standards* for details.

### L.4.6 Data Structure [October 2011]

All Preliminary or Final FIRM data must consistently follow the data structure described in Section L.8.

#### L.4.6.1 Tiling and Physical Map Revisions [October 2011]

The assigned mapping partner shall submit all digital data in a series of thematic files that cover the entire geographic area being mapped and not in individual small tiles that cover limited geographic areas. Preliminary or Final FIRM Databases should normally cover an entire county (or county equivalent). In situations where countywide mapping is not practical, the FIRM Database must cover an entire community or a subset of panels for a community or county.

PMRs may be initiated by FEMA (as an update) or from external sources, such as a community. The NFHL shall be the initial digital mapping source of the PMR. During the data development stage of the PMR, panels of the NFHL making up the PMR area shall be acquired from the MSC.

In all cases, all FIRM panels affected by the PMR shall get new effective dates. All effective LOMRs within the PMR-affected FIRM panels shall be incorporated as part of the PMR. For each panel being updated, the base map shall be reviewed to determine if it should be updated as well. Base map data shall not be updated for panels that are not affected by the PMR. Prior to Quality Review 5, a check must be performed to determine if additional LOMRs have become effective in the areas of the county with non-revised flood zones, and any new LOMRs are incorporated into the FIRM Database. At this stage, for a period 60 days until the Letter of Final Determination and six months until effective, there will be a hold on processing of all LOMRs within the PMR area. Upon the effective date of the PMR, the PTS contractor incorporates the revised panels into the Regional Flood Hazard Layer (RFHL) and propagates to the NFHL. PMR databases will be made available from the MSC.

### L.4.6.2 Topology

[October 2011]

The tolerance of the FIRM Database should be specified at its creation, as it cannot be changed once the geodatabase is established. References to feature classes, feature datasets, feature dataset topology layers, and feature class cluster tolerance are specific to the PGDB format. Mapping partners working in SHP format must comply with the same topology rules and cluster tolerance requirements of any automated database checks currently mandated as part of the official FEMA quality review process, pursuant to *Procedure Memorandum 42* or any subsequent revisions. See Table L-4 for a breakdown of topology rules, participating layers, and cluster tolerance definitions.

By industry recommendation, the resolution of a geodatabase should be 10 times smaller than the established tolerance. Based on this recommendation, the minimum resolution of any feature class or feature dataset created to store FIRM data will be 0.025 feet (0.00762 meters). Therefore, no feature class or feature dataset shall be created with a horizontal cluster tolerance value smaller than 0.25 feet (0.0762 meters).

Unnecessary nodes and vertices should be avoided while still maintaining the Floodplain Boundary Standard certification requirements outlined in *Revised Procedure Memorandum No. 38 – Implementation of Floodplain Boundary Standard (Section 7 of MHIP VI.0)*, dated October 17, 2007, or any subsequent revisions. Vertices must be placed conservatively when designing features, so that only the minimum number of vertices or nodes are used to create the desired shape with appropriate smoothness (e.g., a straight line will be defined with two nodes only) when viewed at map scale.

Feature size will be dictated by the horizontal cluster tolerance in the feature's respective topology layer. By default, the horizontal cluster tolerance value specified is 0.25 feet (0.0762 meters), validating the "Must Be Larger Than Cluster Tolerance" rule will verify that no features smaller than 0.25 feet (0.0762 meters) exist in the FIRM Database.

Vector data files must meet the following data structure requirements:

- Digitized linework must be collected at a reasonably fine line weight.
- Only simple point, polyline, and polygon elements may be used. Multi-part features are not allowed.
- Line features must be continuous (no dashes, dots, patterns, or hatching).
- Spatial files must not contain any linear or area patterns.



- Area spatial features for a given theme must cover the entire flood risk project area without overlaps, or sliver polygons between adjacent polygons. Gaps or overshoots between features that should close must be eliminated.

**Table L-4. Topology Rules**

Topology Filename (*_TOPOLOGY)	Spatial Layer	Topology Rule	Parameter	Minimum Cluster Tolerance (ft)
BASE_INDX	S_BASE_INDEX	Must Be Larger Than Cluster Tolerance		0.25
BFE_XS	S_BFE	Must Be Larger Than Cluster Tolerance		0.25
BFE_XS	S_BFE	Must Not Overlap		0.25
BFE_XS	S_BFE	Must Not Have Pseudo nodes		0.25
BFE_XS	S_BFE	Must Be Single Part		0.25
BFE_XS	S_BFE	Must Not Overlap With Lettered Cross Sections	S_XS	0.25
BFE_XS	S_XS	Must Be Larger Than Cluster Tolerance		0.25
BFE_XS	S_XS	Must Not Overlap		0.25
BFE_XS	S_XS	Must Not Have Pseudo nodes		0.25
BFE_XS	S_XS	Must Be Single Part		0.25
CBRS	S_CBRS	Must Be Larger Than Cluster Tolerance		0.25
CBRS	S_CBRS	Must Not Overlap		0.25
FIRM_PAN	S_FIRM_PAN	Must Be Larger Than Cluster Tolerance		0.25
FIRM_PAN	S_FIRM_PAN	Must Not Overlap		0.25
FIRM_PAN	S_FIRM_PAN	Must Not Have Gaps		0.25
FLD_HAZ_POL	S_FLD_HAZ_AR	Must Be Larger Than Cluster Tolerance		0.25
FLD_HAZ_POL	S_FLD_HAZ_AR	Must Not Overlap		0.25
FLD_HAZ_POL	S_FLD_HAZ_AR	Must Not Have Gaps		0.25
FLD_HAZ_POL	S_FLD_HAZ_AR	Boundary Must Be Covered By	S_FLD_HAZ_LN	0.25
FLD_HAZ_POL	S_FLD_HAZ_AR	Boundary Must Be Covered By Feature Class Of	S_POL_AR	0.25
FLD_HAZ_POL	S_FLD_HAZ_LN	Must Be Larger Than Cluster Tolerance		0.25
FLD_HAZ_POL	S_FLD_HAZ_LN	Must Not Overlap		0.25
FLD_HAZ_POL	S_FLD_HAZ_LN	Must Not Intersect		0.25
FLD_HAZ_POL	S_FLD_HAZ_LN	Must Not Have Dangles		0.25
FLD_HAZ_POL	S_FLD_HAZ_LN	Must Be Covered By Boundary Of	S_FLD_HAZ_AR	0.25

## Appendix L

Topology Filename (*_TOPOLOGY)	Spatial Layer	Topology Rule	Parameter	Minimum Cluster Tolerance (ft)
FLD_HAZ_POL	S_FLD_HAZ_LN	Must Be Single Part		0.25
FLD_HAZ_POL	S_POL_AR	Must Be Larger Than Cluster Tolerance		0.25
FLD_HAZ_POL	S_POL_AR	Must Not Overlap		0.25
FLD_HAZ_POL	S_POL_AR	Must Not Have Gaps		0.25
GEN_ST	S_GEN_STRUCT	Must Be Larger Than Cluster Tolerance		0.25
GEN_ST	S_GEN_STRUCT	Must Not Overlap		0.25
GEN_ST	S_GEN_STRUCT	Must Be Single Part		0.25
LEVEE	S_LEVEE	Must Be Larger Than Cluster Tolerance		0.25
LEVEE	S_LEVEE	Must Not Overlap		0.25
LEVEE	S_LEVEE	Must Be Single Part		0.25
LIMWA	S_LiMWA	Must Be Larger Than Cluster Tolerance		0.25
LIMWA	S_LiMWA	Must Not Overlap		0.25
LIMWA	S_LiMWA	Must Be Single Part		0.25
PFD	S_PFD_LN	Must Be Larger Than Cluster Tolerance		0.25
PFD	S_PFD_LN	Must Not Overlap		0.25
PFD	S_PFD_LN	Must Be Single Part		0.25
PLSS	S_PLSS_AR	Must Be Larger Than Cluster Tolerance		0.25
PLSS	S_PLSS_AR	Must Not Overlap		0.25
PLSS	S_PLSS_AR	Must Not Have Gaps		0.25
PROFIL	S_PROFIL_BASLN	Must Be Larger Than Cluster Tolerance		0.25
PROFIL	S_PROFIL_BASLN	Must Not Overlap		0.25
PROFIL	S_PROFIL_BASLN	Must Be Single Part		0.25
SUBBAS	S_SUBBASINS	Must Be Larger Than Cluster Tolerance		0.25
SUBBAS	S_SUBBASINS	Must Not Overlap		0.25
TRNS	S_TRNSPORT_LN	Must Be Larger Than Cluster Tolerance		0.25
TRNS	S_TRNSPORT_LN	Must Not Overlap		0.25
TRNS	S_TRNSPORT_LN	Must Be Single Part		0.25
TSCT	S_CST_TSCT_LN	Must Be Larger Than Cluster Tolerance		0.25
TSCT	S_CST_TSCT_LN	Must Not Overlap		0.25
TSCT	S_CST_TSCT_LN	Must Be Single Part		0.25

Topology Filename (*_TOPOLOGY)	Spatial Layer	Topology Rule	Parameter	Minimum Cluster Tolerance (ft)
WTR	S_WTR_AR	Must Be Larger Than Cluster Tolerance		0.25
WTR	S_WTR_LN	Must Be Larger Than Cluster Tolerance		0.25
WTR	S_WTR_LN	Must Not Overlap		0.25
WTR	S_WTR_LN	Must Be Single Part		0.25

### L.4.6.3 Edgematching

[October 2011]

The matching of features on both sides of the “edge” of a hardcopy map or tiles of digital data is critical in the creation of digital map products. Proper edgematching will ensure that a digital map product can be used as a seamless data layer in a GIS. As edges are digitized, features that cross the edge should snap together to form a seamless feature. Obtaining the most recent version of the NFHL and periodically checking for updates to adjacent data are the first steps of any edgematching procedure.

The assigned mapping partner shall ensure that all submitted digital data are tied into any existing digital data files for a seamless transition. The assigned mapping partner may produce new digital data to reflect new flood hazard information or to convert effective flood hazard information to a digital format depending on the scope of the flood risk project. Hardcopy deliverables must reflect both the new digital data and any existing digital data previously prepared by FEMA. If no existing digital floodplain data are available from FEMA, deliverables must reflect the new digital data only. The assigned mapping partner must ensure that proper edgematching is performed at each step of the data creation process. If the mapping partner digitizes separate hardcopy sheets to produce the draft FIRM data, the mapping partner must check that all features that cross the boundaries between separate sheets are smooth and continuous at the sheet and jurisdiction boundaries. The following are edgematching problems that the assigned mapping partner must avoid:

- **Disconnects:** Disconnects occur when the linework for features does not connect, being either too short or too long at the source maps’ edge.
- **Jogs:** Jogs occur when a common feature on adjoining maps does not line up seamlessly.
- **Missing Features:** Missing features are those that appear on one source map, but not on the adjacent map. The features may be missing for a variety of reasons, such as (1) different dates of the two maps; (2) an error in one map; (3) a difference in interpretation by the cartographers of the two maps; (4) differing scales of the two source maps, or (5) adjacent data not available.
- **Different Representation of Features:** This occurs when features are represented differently on the source maps. For example, a stream is a double line on one, and a single line on the other.

### L.4.6.4 Digitizing Standards

[October 2011]

All features must be digitized in their true positions as points, lines, or polygons. Digitized data must meet FEMA’s horizontal accuracy standards.

When digitizing maps, it is important to measure how well the registration control points line up to the map. The measurement of fit is sometimes called the Root Mean Squared Error (RMSE). The RMSE value represents the amount of error between new and original coordinate locations calculated by the transformation process. The RMSE should be minimized, and the spatial features on the maps must be as close to their true location on the base map as possible.

- Digitized linework must be collected at a reasonably fine line weight.
- Only simple line strings or simple linear elements may be used for all linework.
- Line features must be continuous (no dashes, dots, patterns, or hatching).

### L.4.6.5 Vertex spacing

[October 2011]

Vertices along digitized or generated boundaries should be spaced such that, on average, no vertices exist within a 10-foot ground sample distance from one another. Exceptions may occur in areas of finger flooding to ensure the flood zone is properly delineated. Exceptions should be documented in the metadata. Floodplain Boundary Standard (FBS) requirements must be met, as outlined in the FEMA *Revised Procedure Memorandum No. 38 – Implementation of Floodplain Boundary Standard (Section 7.0 of MHIP 1.0)* dated October 17, 2007, as well as the *Floodplain Standards Audit Procedures*, version 2.0 dated October 17, 2007.

If boundaries are delineated on highly accurate topographic data, denser vertex spacing may be required. Wherever possible, vertices should be thinned to meet the average 10-foot ground spacing, while allowing for small localized areas of denser spacing.

### L.4.6.6 PGDB Standards

[October 2011]

Personal geodatabases must be submitted in Esri Personal Geodatabase version 9.3 format or higher, and the version must be accurately documented in the FIRM Database metadata file.

All spatial FIRM layers should exist within one feature dataset. The feature dataset assists in the creation of topology layers when necessary and allows for the expansion of topology rules in the future. The single FIRM Database feature dataset must be named “FIRM\_Spatial\_Layers” in order to aid in the automated loading of spatial layers into the DVT automated checking tool and the NFHL.

Non-spatial tables shall exist outside of the FIRM\_Spatial\_Layers feature dataset, but inside the PGDB.

### L.4.6.7 XY Tolerance for Geodatabases

[October 2011]

The XY tolerance for a feature dataset created in a geodatabase to store FIRM data must be 0.25 feet (0.0762 meters).

### L.4.6.8 Coincident Features

[October 2011]

Coincident features are those that share the same location or boundary, such as a flood zone boundary and a floodwall. These coincident features must be superimposed, vertex (shape point) for vertex, within the files. If they are not located properly, it could appear that the flood zone ends before the wall, leaving a strip of land on the waterside of the floodwall that is not in the flood zone. A lack of alignment can cause problems with digital files.

In the FIRM Database, flood hazard data are contained in both area and line features: S\_Fld\_Haz\_Ar and S\_Fld\_Haz\_Ln. For this data theme, two layers are defined because they have attributes that apply to the entire area and attributes that apply to portions of the boundaries of these areas. However, the spatial elements that make up these features must be identical. All elements in the S\_Fld\_Haz\_Ln table must match the boundaries of the elements in the S\_Fld\_Haz\_Ar table, within the specified database tolerance.

### L.4.6.9 Feature Precision

[October 2011]

The position of horizontal control features of the FIRM products will be based on published standards. The assigned mapping partner shall not re-digitize these control features, but shall use the exact coordinates in the published standards. Candidate sources of control points include:

- U.S. Geological Survey 7.5-minute series quadrangle map corner coordinates
- Coordinate grids
- Public Land Survey Systems (PLSS)

### L.4.6.10 Data Compilation

[October 2011]

Existing digital data may affect the choice of scale for data compilation. If base mapping is available at a scale greater than 1" = 400' (e.g. 1" = 200') the assigned mapping partner may choose to compile and digitize the revised data developed during the flood risk project at the base map scale.

In general, the most accurate data source available must be relied upon to reference other features compiled onto the map. This may mean that, in limited circumstances, floodplain boundary delineations made on very high-resolution topographic maps may appear slightly misplaced on a less accurate base map. However, if the base map meets FEMA standards, these differences should be very small. If this policy creates significant visual problems with the floodplain boundary delineations on the base map selected, the mapping partner shall resolve the issue with the FEMA Project Officer.

Likewise, when high-accuracy data are collected for a flood risk project, it is FEMA's goal to maintain the accuracy of those data. For example, cross-section line features must correspond as closely as possible to the actual field survey locations. Often, the mapping partner must graphically extend or reshape that end of a cross section for satisfactory cartographic display.

### L.4.6.11 Relationship of Base Map to Flood Hazard Data

[October 2011]

Base map features are physical features like roads, railroads, rivers, lakes, orthophotography and political boundaries, that map users may rely on to locate an area of interest on the FIRM. For the graphic standards for base map features, refer to *Appendix K* of the *Guidelines and Standards*. Table L-2 lists the base map features and lookup tables, and whether or not they are required or required if applicable.

Flood hazard data include flood insurance risk zones, Base Flood Elevations (BFEs), cross-section locations, and hydraulic structures on a FIRM that depict the results of flood hazard analyses. Some physical features, such as surface water features and hydraulic structures, are also used during flood hazard analyses and may be grouped in either category.

**L.4.6.12 Table Structure and Spatial Files****[October 2011]**

The number of required FIRM Database feature classes and tables will vary depending on whether new flood analyses are part of the flood risk project. In general, the production of any digital map will result in a complete FIRM Database.

Mapping partners must follow the attribute table structure presented in Section L.8. The attribute data must be stored directly in the Esri SHP and Esri PGDB if provided, along with the associated spatial data. The attribute data must not be in an independent data file or relational database format with the exception of DBF files for lookup tables. All of the submitted GIS layers and tables must be the same GIS file format. For instance, a mapping partner cannot submit a portion of the layers in PGDB format and a portion in SHP format.

For a GIS layer or table, inherent field properties specify the type of data and the size of data that will be stored. Generally these properties are identified as the field name, field type, field length, field precision, and field scale. The field name is the unique term used to identify the table column (e.g., WTR\_NM). The field type indicates the type of data that are stored in the table column. Common field types include text, date, float (i.e., a small fractional number), double (i.e., a large fractional number), short integer (i.e., a small integer number), and long integer (i.e., a large integer number).

The definition of the field length, precision, and scale depends on the GIS data file format. For date and numeric field types in a PGDB, the length describes the data size, in bytes, of the field. The length is dependent upon the selected data type, and the user has no control over its value. The precision and scale in a PGDB are not utilized and will show only as a 0 value. For the date field type in a SHP, the length, precision, and scale are inherent and cannot be specified by the user. For the text field type in the PGDB, the user may opt to specify the field length; the default value is 50. In this situation the field length indicates the number of characters that may be stored in the table column (e.g., a text field which has a length of 100 may store no more than 100 alphanumeric characters). Since only the data type and length (for text fields) must be declared for the PGDB, the tables in this Appendix identifying the field properties will not include a specification for precision and scale.

For reference, the default field length, precision, and scale for a PGDB by data type are:

- Double (8, 0, 0)
- Float (4, 0, 0)
- Long Integer (4, 0, 0)
- Short Integer (2, 0, 0)
- Date (8, 0, 0)
- Text (50, 0, 0)

For numeric field types in a SHP file, the field length defines the total number of characters that exist to the left and right of the decimal place. The precision defines the number of characters to the left of the decimal place. The scale defines the number of characters to the right of the decimal place. For those data types that store fractional values (e.g., double and float), the user will define the precision and scale. For SHP files, the scale will be 2 and the precision will be 10. For the date field type in a SHP file, the length, precision, and scale are inherent and cannot be specified by the user. For the text field type, the

field length indicates the number of characters that may be stored in the table column. The tables in this Appendix identifying the field properties will include the specification for the data type, length (for text fields), precision (for numeric fields), and scale.

For reference, the default field length, precision, and scale for a SHP file by data type are:

- Double (19, 0, 0)
- Float (13, 0, 0)
- Long Integer (9, 9, 0)
- Short Integer (4, 4, 0)
- Date (8, 0, 0)
- Text (50, 0, 0)

Each FIRM Database table has a primary key field defined. This field normally uses a name similar to the table name followed by “\_ID.” The mapping partner that creates the digital data must populate these fields. Normally, features in each table will be numbered sequentially using this field, although the mapping partner may choose another method provided it is logical, documented, consistently implemented, and results in a unique ID value for each spatial feature. Each FIRM Database also has a DFIRM\_ID field to store the six-digit code for State and county/community, as well as the VERSION\_ID that stores the version of the FIRM Database standard (which corresponds to the version of *Appendix L*).

In the table documentation in Section L.8, each field name is followed by a letter code as follows:

- R – Required for all records
- A – Required if applicable to spatial feature described

For required fields, Null values are not permitted. In the event that the correct information cannot be obtained for a required or required if applicable field, the FEMA Project Officer may allow the mapping partner to substitute a value that indicates that the affected field was intentionally not populated. Any use of non-populated values must be documented and explained in the metadata. The values to use for non-populated data for each field type are as follows:

- Text: “NP”
- Numeric: -8888
- Date: 8/8/8888

Text fields must follow the capitalization standards per *Appendix K* of the *Guidelines and Standards*. For a field that is required when applicable, but does not apply, the value for text fields must be Null (i.e., the field must be left empty, not set to zero). The mapping partner shall use the value zero only when an attribute has the specific value of zero. Because of limitations in the GIS formats used by FEMA, a true Null value cannot be used for some fields. The value to use for “Null” fields for each field type is as follows:

- Text: Null (or “”, the empty string)
- Numeric: -9999
- Date: 9/9/9999



Date fields in the FIRM Database are stored in the native date format for the data format in which the table is distributed. For PGDB, the default is the Short Date format, and for SHP, the default is the Date format. Using the default PGDB and SHP settings, the output format of the date will be the required MM/DD/YYYY.

## L.4.7 Quality Control

[October 2011]

The digital files must be structured following the FIRM Database schema. This allows for the easy exchange of these data between FEMA, mapping partners, and other flood hazard data users. All duplicated elements must be removed. The data must be horizontally controlled and referenced to the appropriate horizontal and vertical datum. All digitizing must be done carefully and in conformance with FEMA's accuracy standards. The assigned mapping partner must perform a thorough QC review before submitting data to FEMA. FEMA will review the data provided by the mapping partner using automated and interactive techniques.

The following items will be verified as part of the QC review of the data to ensure that all deliverables meet minimum quality standards:

- All required features have been included.
- The data are correctly referenced to State Plane or UTM grid coordinates.
- The correct horizontal and vertical datum has been used and is clearly indicated.
- Character of features has been maintained (e.g., straight lines are straight).
- No obvious discontinuities exist (e.g., gaps, overshoots).
- Required labels (text) have been placed.
- All data agree with the flood hazard analyses (e.g., regulatory floodway widths match within tolerances set in *Appendices C and J*) and cross-section labeling agrees with the appropriate computer model.
- Feature attributes are correct.
- Pseudo-nodes or shape points have been kept to the minimum required to maintain the correct character of the features.
- No geometries shall exist in the deliverable FIRM Database where the average space between vertices is less than a 10-foot ground sample distance other than the exception specified in Section L-4.6.5.

For the QC review, the mapping partner must submit the FIRM Database in Esri Shapefile or Esri Personal Geodatabase format. Additionally, the mapping partner must provide raster copies of the Preliminary or Final effective FIRM panels. For graphic standards of raster FIRM panels, please refer to *Appendix K* of the *Guidelines and Standards*.

All submitted data must be able to pass FEMA's automated quality control system. A detailed description of the automated checks performed on FIRM Database submissions can be found in the *DVT - Topology Verification Guide* and the *DFIRM Verification Check Standard*.



### L.4.8 Deliverables

[October 2011]

A complete FIRM Database submittal to the MSC will comprise the following items:

- FIRM Database files in Esri Shapefile and Esri Personal Geodatabase version 9.3 or higher;
- Digital georeferenced PNG or TIF files of all FIRM panels that comply with the mapping standards listed in *Appendix K* of the *Guidelines and Standards*;
- Digital orthophotography base map files, if applicable;
- A metadata file in accordance with *FEMA NFIP Metadata Profile for Draft, Preliminary, and Final FIRM Datasets*, dated April 6, 2006, Version 1.0.1;
- A PDF version of the FIS report with bookmarks for the section heading and profiles in compliance with *Appendix J* and *Procedure Memorandum No. 66*. This PDF must be made from the native files, not scans, and the PDF must allow for text extraction in order to aid in future revisions to the FIS report;
- A PNG version of the color FIRM Panel Index map in 11x17 format, georeferenced with associated world file;
- A PDF version of the FIRM Panel Index map in 11x17 format for use in the FIS report; and
- Digital RASLOT databases, DWG, or DXF output files for all profiles in the FIS report. If unsteady flow models exist, profiles are to be submitted in DWG or DXF format.

Digital orthophoto files may be submitted in Tagged Image File (.TIF) format, Georeferenced TIF (GeoTIFF), Band Interleaved by Pixel (.BIP or .BIL), Multi-Resolution Seamless Image Database (MrSID), Portable Network Graphics (PNG), Enhanced Compression Wavelet (ECW) or Joint Photographic Experts Group (JPEG) format. Raster files, including the FIRM panel index, must be accompanied by a file providing coordinate information that will allow the images to be georeferenced (e.g., a tfw file).

All deliverable files must meet the standards set forth by the MSC. Refer to the *MSC Deliverables Guide* for additional information.

### L.4.9 Metadata

[October 2011]

To facilitate the use of FIRM Database and the transfer of data files between users, a metadata file shall accompany all digital data submittals. Only one metadata file is required for each flood risk project. However, in this file, the assigned mapping partner must distinguish between the different origins of the various datasets included. The metadata file must follow the *FEMA NFIP Metadata Profile for Draft, Preliminary, and Final FIRM Datasets*. Details of this standard are available at FEMA's Mapping Information Platform (<https://hazards.fema.gov>).

This metadata file must include a description of the source material from which the data were derived and the methods of derivation, including all transformations involved in producing the final digital files. The description must include the dates of the source material and the dates of ancillary information used for the update. The date assigned to a source must reflect the date that the information corresponds to the ground condition. If the mapping partner does not know this date, the mapping partner may use the date of publication and indicate as such. For each data source in the metadata file, the mapping partner shall assign a Source Citation Abbreviation as described under Data Source Coordination in Subsection L.4.3.

The mapping partner shall describe any database created by merging information obtained from distinct sources in sufficient detail to identify the actual source for each element in the file.

Because not all FIRM Database tables are included in every FIRM Database, the Overview Description Section of the Entity and Attribute Information should include a list of all FIRM Database layers and tables included in the submittal. PMR FIRM metadata will need to include descriptions of all updated FIRM layers, whether or not they are represented on the PMR panels.

## L.5. Database Table Structure Requirements for Draft Digital Data [October 2011]

This section has been removed from this version of *Appendix L*.

## L.6. Federal Emergency Management Agency Digital Mapping Information Checklist [October 2011]

This section has been removed from this version of *Appendix L*.

### L.7. Metadata Example for Draft Digital Data [October 2011]

This section has been removed from this version of *Appendix L*.

## L.8. Database Table Structure Requirements for Preliminary and Final Flood Insurance Rate Map Databases [October 2011]

### L.8.1 Table: S\_Alluvial\_Fan [October 2011]

This table is required when the modeling includes alluvial fans. Only the 1-percent-annual-chance flood is mapped for alluvial fans. The alluvial fan could be mapped as: Zone AO areas with depths and velocities; Zone AO areas with just depths; or Zone A, AE, or X. This information is needed for the Summary of Alluvial Fan Analyses and Results of Alluvial Fan Analyses tables in the FIS report.

The spatial entities representing the alluvial fans are polygons.

The S\_Alluvial\_Fan layer contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
ALLUVL_ID	R	Primary key for table lookup. Assigned by table creator.
ACTIVE_FAN	R	Active Fan Designation. This value specifies if the alluvial fan is currently active. This field will be true when the alluvial fan is active. It should be false when the fan is inactive. Acceptable values for this field are listed in the D_TrueFalse table.
FANAPEX_DA	R	Drainage Area at Fan Apex.
AREA_UNITS	R	Units of Alluvial Fan Drainage Area. This unit indicates the measurement system used for drainage area. This would normally be in square miles. Acceptable values for this field are listed in D_Area_Units table.
FANAPEX_Q	R	1-percent-annual-chance Discharge at Fan Apex.
DISCH_UNIT	R	Units of Alluvial Fan Discharge. This unit indicates the measurement system used for discharge. This would normally be in cubic feet per second (cfs). Acceptable values for this field are listed in the D_Discharge_Units table.
FAN_VEL_MN	A	Alluvial Fan Minimum Velocity. This value represents the minimum velocity of the 1-percent-annual-chance flood flow in this area, if there is a velocity range specified. If there is only one velocity listed, it must be entered here. This field is populated when the FAN program is used for analysis.

FAN_VEL_MX	A	Alluvial Fan Maximum Velocity. This value represents the maximum velocity of the 1-percent-annual-chance flood flow in this area, if there is a velocity range specified. This field is populated when the FAN program is used for analysis.
VEL_UNIT	A	Velocity Unit. This is the unit of measurement for the velocity of the 1-percent-annual-chance flood. This field is populated when the VELOCITY field is populated. Acceptable values for this field are listed in the D_Velocity_Units table.
DEPTH	A	Depth. This is the depth of the 1-percent-annual-chance flood for Zone AO areas. This field is populated if the hydraulic analysis determines a depth for the AO zone.
DEPTH_UNIT	A	Depth Units. This unit indicates the measurement system used for depths. This field is populated when the DEPTH field is populated. Acceptable values for this field are listed in the D_Length_Units table.
FLD_ZONE	R	Flood Zone. This is the flood zone designation for the alluvial fan. These zones are used by FEMA to designate the SFHAs and for insurance rating purposes. NOTE: The symbol '%' is a reserved symbol in most software packages so the word 'percent' was abbreviated to 'PCT.' Acceptable values for this field are listed in the D_Zone table.
METH_DESC	A	Description of Methodology Used In Alluvial Fan analysis. Used in Results of Alluvial Fan Analyses section of an FIS report.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

Table: S\_Alluvial\_Fan [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
ALLUVL_ID	R	Text	25		N/A
ACTIVE_FAN	R	Text	1		D_TRUEFALSE
FANAPEX_DA	R	Double	Default		N/A
AREA_UNITS	R	Text	17		D_AREA_UNITS
FANAPEX_Q	R	Double	Default		N/A
DISCH_UNIT	R	Text	17		D_DISCHARGE_UNITS
FAN_VEL_MN	A	Double	Default		N/A
FAN_VEL_MX	A	Double	Default		N/A
VEL_UNIT	A	Text	30		D_VELOCITY_UNITS
DEPTH	A	Double	Default		N/A
DEPTH_UNIT	A	Text	20		D_LENGTH_UNITS
FLD_ZONE	R	Text	55		D_ZONE
METH_DESC	A	Text	254		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

## L.8.2 Table: S\_Base\_Index

[October 2011]

The S\_Base\_Index table contains information about the raster data used as a base map for the flood risk project area. This table is required if a raster base map was used as the base map for the FIRM.

The spatial elements representing raster base map tile index features are rectangular polygons. For standard U.S. Geological Survey Digital Ortho Quadrangles, polygons must match quarter-quad boundaries. Otherwise, polygons must match the boundaries of the raster tiles used. Polygonal overlap is acceptable where necessary. S\_Base\_Index is required on both tiled rasters and raster mosaics.

The S\_Base\_Index layer contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
BASE_ID	R	Primary key for table lookup. Assigned by table creator.
FILENAME	R	Base Filename. This filename must be assigned by the raster base map provider or the table creator. The filename should match the filename or specific product identifier assigned by the primary distributor of the raster base map used. This must be the complete filename including the file extension. This identifier must allow the user of the FIRM Database to unambiguously identify the raster base maps used on the FIRM to the primary distributor of the raster base map.
BASE_DATE	R	Base Date. This is the date that raster base map was acquired by the producer of the base map. It corresponds to the ground conditions metadata date value. For a vector base map that is rasterized for distribution, this data should be the acquisition date for the original vector base map.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.



**Table: S\_Base\_Index [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
BASE_ID	R	Text	25		N/A
FILENAME	R	Text	128		N/A
BASE_DATE	R	Date	Default	0	N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

### L.8.3 Table: S\_BFE

[October 2011]

The Base Flood Elevation (BFE) table is required for any digital data where BFE lines will be shown on the corresponding FIRM, with the exception of areas where a profile exists. New for this revision, for areas where a profile exists, the water-surface elevation (BFE value) will be labeled on the cross sections as stored in the FIRM Database S\_XS feature class. The use of BFE lines is now only required in special cases. BFE lines must be placed in the S\_BFE feature class for any area where cross section maximum vertical rise requirement is not met. As mentioned in the description for S\_XS, if there is not at least one mapped cross section in S\_XS for every 1-foot vertical rise in the 1-percent-annual-chance flood elevation, intervening BFE lines must be placed at whole-foot intervals. Other examples include; a riverine AE zone without a flood profile in the FIS report, areas studied with two-dimensional modeling, certain ponding areas, and backwater areas off to the side of streams with flood profiles. BFEs may be used for other exceptions at the discretion of the FEMA Project Officer. Any exceptions to these guidelines should be documented in the metadata.

The mapping partner must avoid overcrowding of the BFE and cross section lines. When a stream is too steep to show BFEs and cross sections for every 1-foot vertical rise in the 1-percent-annual-chance flood elevation, the mapping partner must refer to *Appendix C*, Section 6.3 of these Guidelines for proper spacing procedures or consult the FEMA Project Officer, as needed.

There are cases when S\_BFE may be required in the FIRM Database, even if it is not required by the data submittal requirements in *Appendix M* of these Guidelines. BFE line data can be added to the FIRM Database to meet the 1-foot vertical rise requirement. Table L-5 provides an overview of S\_BFE requirements at different mapping stages.

**Table L-5. S\_BFE Requirements**

Study Scenarios	S_BFE Required by Appendix M?	S_BFE Required in FIRM Database?	BFE Lines Shown on FIRM?
Profiles available for all studied streams and 1-ft vertical rise requirement met for all cross sections	No	No	No
Profiles available for all studied streams and 1-ft vertical rise requirement not met for all cross sections	No	Yes	Yes
Profiles available for some studied streams	Yes	Yes	Yes
Study has two dimensional modeling	Yes	Yes	Yes
Study contains ponding areas or backwater areas	Yes	Yes	Yes
Study contains exceptions approved by FEMA Project Officer	Yes	yes	Yes

The S\_BFE contains information about the BFEs within a flood risk project area. A spatial file with location information also corresponds with this data table. BFE lines indicate the whole-foot water-surface elevation of the 1-percent-annual-chance flood.

The spatial elements representing BFE features are lines extending from Special Flood Hazard Area (SFHA) boundary to SFHA boundary. The ends of the BFE lines must be snapped precisely to the SFHA

boundary. Each BFE is represented by a single line with no pseudo-nodes. Where BFE lines are shown, they must be consistent with procedures described in *Volume 1* of these Guidelines.

The S\_BFE layer contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
BFE_LN_ID	R	Primary key for table lookup. Assigned by table creator.
ELEV	R	The rounded, whole-foot elevation of the 1-percent-annual-chance flood. This is the value of the BFE that is printed next to the BFE line on the FIRM.
LEN_UNIT	R	BFE Units. This unit indicates the measurement system used for the BFEs. Normally this would be feet. Acceptable values for this field are listed in the D_Length_Units table.
V_DATUM	R	Vertical Datum. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally this would be North American Vertical Datum of 1988 for new studies. Acceptable values for this field are listed in the D_V_Datum table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_BFE [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
BFE_LN_ID	R	Text	25		N/A
ELEV	R	Double	Default	2	N/A
LEN_UNIT	R	Text	11		D_LENGTH_UNITS
V_DATUM	R	Text	17		D_V_DATUM
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

### L.8.4 Table: S\_CBRS

[October 2011]

The S\_CBRS layer only applies to coastal areas that have specially protected areas designated by Congress on John H. Chafee Coastal Barrier Resources System (CBRS) maps. Authoritative CBRS boundary locations are shown on maps administered by the U.S. Fish and Wildlife Service. Normally, these areas are already shown on existing FIRMs for the area. CBRS areas have restrictions on Federal funding (including flood insurance coverage) after specified dates for new or substantially improved structures. This table is required when CBRS areas occur in the jurisdiction. See *Appendix K* of these Guidelines for more detailed information about CBRS areas. This information is needed for the Coastal Barrier Resources System Information table in the FIS report and for the FIRM panels.

The spatial entities representing the CBRS and Other Protected Areas (OPA) features are polygons. There is a polygon for each CBRS unit.

The S\_CBRS table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
CBRS_ID	R	Primary key for table lookup. Assigned by table creator.
CBRS_TYP	R	CBRS Type. The type code provides details of the types of prohibitions that apply to the area. Normally this would be a CBRS area or Otherwise Protected Area (OPA). This must be indicated on the FIRM panel with a note or with a fill pattern indicated on the legend. Acceptable values for this field are listed in the D_CBRS_Typ table.
CBRS_DATE	R	CBRS Date. Legislative or administrative date on which prohibitions for the CBRS area apply. This must be indicated on the FIRM panel with a note or with a fill pattern indicated on the legend.
WTR_NM	R	Primary CBRS Flooding Source, e.g. Atlantic Ocean, Gulf of Mexico, Chesapeake Bay, etc . This is the formal name of the surface water feature associated with the CBRS or OPA, as listed in the FIS Report Coastal Barrier Resources System Information table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

Table: S\_CBRS [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
CBRS_ID	R	Text	25		N/A
CBRS_TYP	R	Text	35		D_CBRS_TYP
CBRS_DATE	R	Date	Default	0	N/A
WTR_NM	R	Text	100		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

### L.8.5 Table: S\_Cst\_Gage

[October 2011]

The S\_Cst\_Gage layer is required when gage information (from tide, wind, or buoy stations) is used in the determination or to support flood height calculations. Specifically, this table is required in the following situations: when tide gage information is used to support the calibration and validation of hydrodynamic models; when tide gage information is used in the determination of flood elevations by statistical analyses of annual extrema; when wave buoy data provides information regarding the wave climate in the flood risk project area; when wave buoy data has been used in the estimation of offshore wave conditions; for calibration and validation of a numerical wave model; and when data from wind stations has been used for water level hindcasts or wave estimation. Wave heights, wave period, and spectral parameters computed during the flood risk project must be compared with observed data from wave buoys whenever possible.

The S\_Cst\_Gage table contains information about coastal gages for the flood risk project area. The spatial location of these gages may be some distance from the areas for which coastal flood hazards were determined. This information is needed for the Tide Gage Analysis Specifics table in the FIS report.

The spatial entities representing the coastal gages are points.

The S\_Cst\_Gage table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
CSTGAGE_ID	R	Primary key for table lookup. Assigned by table creator.
CST_MDL_ID	A	Coastal Model Identification. This is the foreign key to the L_Cst_Model table. The L_Cst_Model table contains detailed information about the coastal models that were used to determine the coastal flood hazard for the area of each individual gage. This ID field should contain a number that matches the CST_MDL_ID field for a record in the L_Cst_Model. Multiple gages may link to a single record in the L_Cst_Model table. This field is required for new coastal studies.
GAGE_NM	R	Gage Name. This is the name of the gage assigned by the agency maintaining the gage. This field can include information such as gage station ID number, gage name, and location description. It is used in the FIS Report Tide Gage Analysis Specifics table.
AGENCY	R	Gage Agency. This is the name of the agency maintaining the gage. It is used in the FIS Report Tide Gage Analysis Specifics table.
REC_INTVL	A	Recording Interval. This is the interval of time at which the gage records data. This field is populated only if the coastal gage is a fixed-interval gage.

TIME_UNIT	A	Recording Interval Time Unit. This field is populated only if the coastal gage is a fixed-interval gage. Acceptable values for this field are listed in the D_Time_Units table.
START_PD	R	Gage Record Starting Date. This is the date for the start of the earliest period of record used in gage analysis. This field is used in the FIS Report Tide Gage Analysis Specifics table to calculate the length of record.
START_TIME	A	Gage Record Starting Time. This is the time for the start of the earliest period of record used in gage analysis. This value should be formatted as hh:mm. This field is populated when the starting time is available.
END_PD	R	Gage Record Ending Date. This is the date for the end of the latest period of record used in gage analysis. This field is used in the FIS report Tide Gage Analysis Specifics table to calculate the length of record.
END_TIME	A	Gage Record Ending Date. This is the time for the end of the latest period of record used in gage analysis. This value should be formatted as hh:mm. This field is populated when the end time is available.
GAGE_TYPE	R	Gage Type. This value indicates the type of coastal gage. It is used in the FIS report Tide Gage Analysis Specifics table. Acceptable values for this field are listed in the D_Gage_Typ table.
V_DATUM	R	Vertical Datum. The vertical datum indicates the reference surface from which the gage elevations are measured. Acceptable values for this field are listed in the D_V_Datum table.
DATUM_CONV	A	Vertical Datum Conversion. This is the value used to convert from the gage datum (such as MLLW and MSL) to NAVD88. This value may be a decimal number. This field is populated when there is a vertical datum conversion between the gage data datum and NAVD88.
TIDE_TF	R	Record Tide Elevations. Does the gage record tide elevations? Acceptable values for this field are listed in the D_TrueFalse table.
TIDE_EPOCH	A	Tidal Epoch. This field stores the date range for the tidal epoch; for example, "1983-2001." This field is populated when the tide gage information is available.
TIDE_VBM	A	Tide Benchmark Vertical Marker. This is the NOAA, NGS, or community-assigned permanent benchmark identifier. The identifier must be unique for each benchmark.
WVDIR_TF	R	Record Wave Direction. Does the gage record wave direction? Acceptable values for this field are listed in the D_TrueFalse table.
WVSPEC_TF	R	Record Wave Spectra. Does the gage record wave spectra? Acceptable values for this field are listed in the D_TrueFalse table.
WDSPD_TF	R	Record Wind Speed. Does the gage record wind speed? Acceptable values for this field are listed in the D_TrueFalse table.
WDDIR_TF	R	Record Wind Direction. Does the gage record wind direction? Acceptable values for this field are listed in the D_TrueFalse table.
WDSTN_HT	A	Wind Station Height. This is the height of the wind station above ground elevation. This field is populated when wind gage data are used in the flood risk project.

**SOURCE\_CIT** R Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L\_Source\_Cit.

**Table: S\_Cst\_Gage [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
CSTGAGE_ID	R	Text	25		N/A
CST_MDL_ID	A	Text	25		L_CST_MODEL
GAGE_NM	R	Text	150		N/A
AGENCY	R	Text	150		N/A
REC_INTVL	A	Text	11		N/A
TIME_UNIT	A	Text	20		D_TIME_UNITS
START_PD	R	Date	Default	0	N/A
START_TIME	A	Text	10		N/A
END_PD	R	Date	Default	0	N/A
END_TIME	A	Text	10		N/A
GAGE_TYPE	R	Text	40		D_GAGE_TYP
V_DATUM	R	Text	17		D_V_DATUM
DATUM_CONV	A	Double	Default		N/A
TIDE_TF	R	Text	1		D_TRUEFALSE
TIDE_EPOCH	A	Text	11		N/A
TIDE_VBM	A	Text	11		N/A
WVDIR_TF	R	Text	1		D_TRUEFALSE
WVSPEC_TF	R	Text	1		D_TRUEFALSE
WDSPD_TF	R	Text	1		D_TRUEFALSE
WDDIR_TF	R	Text	1		D_TRUEFALSE
WDSTN_HT	A	Long Integer	Default		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT



### L.8.6 Table: S\_Cst\_Tsct\_Ln

[October 2011]

The S\_Cst\_Tsct\_Ln layer is required for all coastal studies for which transect-based analyses are performed. Normally this is any area with a coastal flood risk project. The S\_Cst\_Tsct\_Ln table contains information about the Coastal Transect Lines within the flood risk project area, if applicable. The transect lines indicate the location that was used to provide representative topographic information for the coastal flood models used. Hydraulic analyses of coastal flood effects are executed along transects, which are cross sections taken perpendicular to the shoreline, representing a segment of coast with similar characteristics. Transect elevations are interpolated to delineate the coastal flood zones.

The spatial elements representing coastal transects are lines that generally extend from offshore all the way across the coastal floodplain. Transects can also extend seaward when wave runup modeling is used to determine coastal flood hazards. Each transect should be represented by a single line feature without the circles on each end shown on the hard copy map. The location and shape of the lines should depict the position of the transect as accurately as possible. This information is needed for the Transect Locator Map table and Coastal Transect Parameters table in the FIS report.

The S\_Cst\_Tsct\_Ln table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
TRAN_LN_ID	R	Primary key for table lookup. Assigned by table creator.
TBASELN_ID	R	Foreign key to S_Tsct_Basln. Connects the coastal transect to the appropriate transect baseline in S_Tsct_Basln.
TRAN_NO	R	Transect Number. The transect number as shown on the FIRM or in the FIS report. Each transect is normally numbered sequentially.
METHOD	A	Transect Source Method. This value describes the general methodology used in deriving the station and elevation point data along transects used in coastal flood hazards. Acceptable values for this field are listed in the D_Method table. When the data development task is related to coastal redelineation or digital conversion, this field is populated when the data are available. For new coastal analysis, this field is always populated.
XCOORD	R	X-Coordinate. This is the X-coordinate of the 0.0-foot elevation point along the transect. This point must fall on the transect and have the same horizontal datum of the subsequent flood insurance study. The coordinates must be entered using the same coordinate system intended for the FIRM Database. Typically the 0.0-foot elevation point would represent the point of intersection between the S_Tsct_Basln and S_Cst_Tsct_Ln spatial files.

YCOORD	R	Y-Coordinate. This is the Y-coordinate of the 0.0-foot elevation point along the transect. This point must fall on the transect and have the same horizontal datum as the subsequent FIRM study. The coordinates must be entered using the same coordinate system intended for the FIRM Database. Typically the 0.0-foot elevation point would represent the point of intersection between the S_Tsct_Basln and S_Cst_Tsct_Ln spatial files. This field is used in the Coastal Transect Parameters table in the FIS report.
WTR_NM	R	Surface Water Feature Name. This is the formal name of the surface water feature acting as the primary flooding source for the transect line.
V_DATUM	R	Vertical Datum. This is the vertical datum in which the transect lines were drawn. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally this would be NAVD88. Acceptable values for this field are listed in the D_V_Datum table.
DATUM_CONV	A	Vertical Datum Conversion. This is the value used to convert from the gage datum (such as MLLW and MSL) to NAVD88. This value may be a decimal number. This field is populated when there is a vertical datum conversion between the gage data datum and NAVD88.
CSTLN_TYP	R	Coastline Type. This describes the type of coastline. Acceptable values for this field are listed in the D_Cst_Typ table.
BEACH_SET	A	Beach Setting. This field describes the local geomorphic characteristics of the shore and backshore zone. Acceptable values for this field are listed in the D_BeachSet table. See Appendix D of these Guidelines for additional information regarding beach setting. This field is populated for new coastal analysis. Additionally, for coastal redelineation or digital conversion, this field is populated if the data are available.
CST_MDL_ID	A	Coastal Model Identification. This field is the foreign key to the L_Cst_Model table. Multiple transects may link to a single record in the L_Cst_Model table. This field is populated for new coastal studies. This field is also populated for coastal redelineations and digital conversions when the data are available.
EVENT_TYP	R	Flood Event. Identifies the annual percent chance of exceedance for a flooding event such as 0.2-, 1-, 2-, 4, and 10-percent. Acceptable values for this field are listed in the D_Event table.
SWEL	R	Stillwater Elevation. This is the stillwater elevation for the flood event specified in the EVENT_TYP field at the shoreline. This field is populated for new coastal studies.
SIG_HT	A	Significant Wave Height. This is the wave height associated with the 1-percent-annual-chance storm event. It is the average height of the highest 1/3 of all waves. It is used in WHAFIS and RUNUP models. Normally shown in feet. For new wave setup analysis, this field is populated if data are available.
SIG_PD	A	Significant Wave Period. This is the wave period associated with the 1-percent-annual-chance storm event. It is the time it takes for a wave of the significant wave height to pass a point. Normally shown in seconds. For new wave setup analysis, this field is populated if the data are available.
CON_HT	A	Controlling Wave Height. The controlling wave height value is 1.6 times the significant wave height. This field is populated when the controlling wave height is available for the start of each transect. This field is not required if the controlling wave height is not available for the start of each transect, and WHAFIS default values are used.

CON_PD	A	Controlling Wave Period. This is the time it takes for a wave of the controlling wave height to pass a point. Normally shown in seconds. This field is populated when the controlling wave period is available for the start of each transect. This field is not required if the controlling wave period is not available for the start of each transect, and WHAFIS default values are used.
MEAN_HT	A	Mean Wave Height. Average height of all waves. This information is typically derived from wave gage data. This field is populated when gage analysis is performed in the new coastal flood risk project.
MEAN_PD	A	Mean Wave Period. Average period of all waves. This information is typically derived from wave gage data. Normally shown in seconds. This field is populated when gage analysis is performed in the new coastal flood risk project.
FETCH_LEN	A	Fetch Length. This is the starting fetch length. This field is populated when it is used for starting wave conditions for new coastal wave studies.
FTCHLNUNIT	A	Fetch Length Units. This unit indicates the measurement system used for the fetch length. Normally shown in miles. Acceptable values for this field are listed in the D_Length_Units table. This field is populated when it is used for starting wave conditions for new coastal wave studies.
EROS_METH	A	Erosion Methodology. This field describes the erosion methodology. This field is populated when dunes are present in the flood risk project area for the new coastal analysis. Acceptable values for this field are listed in the D_Erosion table.
LOC_DESC	R	Location Description. This field describes the location of the coastal transect, such as “starts at the Atlantic Ocean Shoreline 200 feet east of Main Street.”
LU_SOURCE	A	Land Use Description Source. This describes a land-use data source along the transect (aerial, land-use shapefile, etc.). This field is always populated for new coastal analysis. For data development tasks related to coastal redelineation or digital conversion, this field is populated when data are available.
RUP	R	Wave Runup Elevation. This is the wave runup elevation for the annual chance flood event specified in the EVENT_TYP field. This field is populated for new coastal studies.
ELEV_UNIT	R	Elevation Units. This is the unit of measurement for the SWEL and runup fields. Acceptable values for this field are listed in the D_Length_Units table.
WHAFIS_TF	R	Overland propagation of wave height modeling. Was overland propagation of wave height modeling using FEMA’s WHAFIS model performed? Acceptable values for this field are listed in the D_TrueFalse table.
OVERTOP_TF	R	Wave Overtopping Calculations. Have wave overtopping calculations been performed? Acceptable values for this field are listed in the D_TrueFalse table.
BW_HGT_TF	R	Breaking Wave Height Calculations. Have breaking wave calculations been performed? Acceptable values for this field are listed in the D_TrueFalse table.
HVFLOW_TF	R	High Velocity Flow Calculations. Have high velocity flow calculations been performed? Acceptable values for this field are listed in the D_TrueFalse table.

VZONE_EXT	A	V Zone Extent. This information provides a brief summary to users about the predominant methodology used to determine the landward extent of the V Zone in the vicinity of a transect. Acceptable values for this field are listed in the D_VZone table. When the data development task is related to coastal digital conversion, this field is populated when data are available. For new coastal analysis and redelineation, this field is always populated.
SETUP_DPTH	A	Wave Set-up Depth. This is the depth of the wave setup that is added to the 1-percent-annual-chance elevation. Normally shown in feet. When the data development task is related to coastal redelineation or digital conversion, this field is populated when data are available. For new coastal analysis, this field is populated when the wave setup depth is calculated and available.
WAVE_02PCT	R	0.2-percent Wave Calculations. Were 0.2-percent wave calculations performed? Acceptable values for this field are listed in the D_TrueFalse table.
LEN_UNIT	A	Length Units. This unit indicates the measurement system used for wave setup depth, controlling wave height, significant wave height, or mean wave height. Normally this would be feet. Acceptable values for this field are listed in the D_Length_Units table. This field is populated when the SETUP_DEPTH, CON_HT, SIG_HT, or MEAN_HT field is populated.
TIME_UNIT	A	Units of Time Measurement. This field is populated if there is a value entered for the significant wave period, controlling wave period, or the mean wave period. The period values all should use the same unit of time measurement. Acceptable values for this field are listed in the D_Time_Units table. This field is populated when the SIG_PD, CON_PD, or MEAN_PD field is populated.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

Table: S\_Cst\_Tsct\_Ln [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
TRAN_LN_ID	R	Text	25		L_CST_TSCT_ELEV
TBASELN_ID	R	Text	25		S_TSCT_BASLN
TRAN_NO	R	Text	4		N/A
METHOD	A	Text	20		D_METHOD
XCOORD	R	Double	Default		N/A
YCOORD	R	Double	Default		N/A
WTR_NM	R	Text	100		N/A
V_DATUM	R	Text	17		D_V_DATUM
DATUM_CONV	A	Double	Default		N/A
CSTLN_TYP	R	Text	50		D_CST_TYP
BEACH_SET	A	Text	75		D_BEACHSET
CST_MDL_ID	A	Text	25		L_CST_MODEL
EVENT_TYP	R	Text	25		D_EVENT
SWEL	R	Double	Default		N/A
SIG_HT	A	Double	Default		N/A
SIG_PD	A	Double	Default		D_TIME_UNITS
CON_HT	A	Double	Default		N/A
CON_PD	A	Double	Default		N/A
MEAN_HT	A	Double	Default		N/A
MEAN_PD	A	Double	Default		N/A
FETCH_LEN	A	Double	Default		N/A
FTCHLNUNIT	A	Text	20		D_LENGTH_UNITS
EROS_METH	A	Text	15		D_EROSION
LOC_DESC	R	Text	250		N/A
LU_SOURCE	A	Text	254		N/A
RUP	R	Double	Default		N/A
ELEV_UNIT	R	Text	20		D_LENGTH_UNITS
WHAFIS_TF	R	Text	1		D_TRUEFALSE
OVERTOP_TF	R	Text	1		D_TRUEFALSE
BW_HGT_TF	R	Text	1		D_TRUEFALSE
HVFLOW_TF	R	Text	1		D_TRUEFALSE
VZONE_EXT	A	Text	28		D_VZONE
SETUP_DPTH	A	Double	Default		N/A
WAVE_02PCT	R	Text	1		D_TRUEFALSE

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
LEN_UNIT	A	Text	11		D_LENGTH_UNITS
TIME_UNIT	A	Text	20		D_TIME_UNITS
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

### L.8.7 Table: S\_Datum\_Conv\_Pt [October 2011]

The S\_Datum\_Conv\_Pt table is required when a vertical datum conversion was performed as part of the flood risk project. The spatial elements representing this layer are points. This information is used in the FIS report Datum Conversion Locations and Values table. This table must be populated whether a countywide /community-based or stream-by-stream based datum conversion factor is required. There cannot be a mixture of countywide/community-based and stream-by-stream conversion factors within one FIRM Database. *Appendix B* of the *Guidelines and Standards* Section B.4.1.2 should be referenced to determine which type of factor must be calculated. This information is needed for the Countywide Vertical Datum Conversion and Stream-by-Stream Vertical Datum Conversion tables in the FIS report.

If the range of conversion factors results in a maximum offset from the established average conversion factor of less than 0.25 foot, the mapping partner shall capture the datum conversion factors at USGS Quadrangle corners.

In situations where the range of conversion factors across the subject community is prohibitively high (thereby resulting in a maximum offset from the established average conversion factor of greater than 0.25 foot), the Mapping Partner performing the flood hazard analyses shall not apply a standard conversion factor for the entire community. Under this approach, the mapping partner performing the flood hazard analyses shall capture the conversion factor for each flooding source by establishing separate conversion factors at the upstream end of the studied reach, at the downstream end, and at an intermediate point, and developing an average conversion factor from those data. In this scenario, no quad corners will be included in the deliverable, only stream points. The S\_Datum\_Conv\_Pt table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
DATCONPTID	R	Primary key for this table. Assigned by table creator.
QUAD_NM	A	Quad Name. Provides the name for the U.S. Geological Survey (USGS) 7.5-minute series topographic quadrangle map. For example "Red Rock." If the points are for a stream-by-stream conversion factor calculation, this field may be left null.
QUAD_COR	A	Quad Corner. Describes one of four quad corners (e.g. NW, SW, NE, and SE). Acceptable values for this field are listed in the D_Quad_Corner table. If the points are for a stream-by-stream conversion factor calculation, this field may be left null.
FROM_DATUM	R	The original vertical datum being converted. Acceptable values for this field are listed in the D_V_Datum table.
TO_DATUM	R	The new vertical datum that is being converted to. Acceptable values for this field are listed in the D_V_Datum table.

WTR_NM	R	The extent of the datum conversion factor calculation of this point. This refers to whether this datum conversion point is used for a whole countywide FIRM or a stream-by-stream datum conversion, as specified in Appendix B of the Guidelines and Standards. Acceptable values for this are either the stream name that this datum conversion point applies to, or the term “COUNTYWIDE/COMMUNITY-BASED” if all the points in the table are for a countywide conversion. Otherwise the stream name is required.
CONVFACTOR	R	Conversion factor at this specific point, not the average of all points. References the vertical datum conversion factor used in observing surface elevations in different datums. The two most common standard vertical datums in use nationwide are the National Geodetic Vertical Datum (NGVD) of 1929 and the North American Vertical Datum (NAVD) of 1988. NGVD 29 to NAVD 88 conversion values range from roughly negative 1 foot or more on the east coast to more than negative 4 feet on the west coast.
LEN_UNIT	R	Length Units. This unit indicates the measurement system used for vertical datum conversion factor height. Normally, this would be feet. Acceptable values for this field are listed in the D_Length_Units table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_Datum\_Conv\_Pt [October 2011]**

Field	R/A	Type	Length/Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
DATCONPTID	R	Text	25		N/A
QUAD_NM	A	Text	50		N/A
QUAD_COR	A	Text	2		D_QUAD_CORNER
FROM_DATUM	R	Text	17		D_V_DATUM
TO_DATUM	R	Text	17		D_V_DATUM
WTR_NM	A	Text	26		N/A
CONVFACTOR	R	Double	Default		N/A
LEN_UNIT	R	Text	20		D_LENGTH_UNITS
SOURCE_CIT	R	Text	11		L_SOURCE_CIT



## L.8.8 Table: S\_FIRM\_Pan

[October 2011]

This table is required for all Preliminary or Final FIRM Databases.

The S\_FIRM\_Pan table contains information about the FIRM panel area. A spatial file with location information also corresponds with this data table.

The spatial entities representing FIRM panels are polygons. The polygon for the FIRM panel corresponds to the panel neatlines. Panel boundaries are generally derived from USGS DOQQ boundaries. As a result, the panels are generally rectangular. FIRM panels must not overlap or have gaps within a study. In situations where a portion of a panel lies outside the jurisdiction being mapped, the user must refer to the S\_Pol\_Ar table to determine the portion of the panel area where the FIRM Database shows the effective flood hazard data for the mapped jurisdiction.

This information is needed for the FIRM Panel Index and the following tables in the FIS report: Listing of NFIP Jurisdictions, Levees, Incorporated Letters of Map Change, and Coastal Barrier Resources System Information.

The S\_FIRM\_Pan table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
FIRM_ID	R	Primary key for table lookup. Assigned by table creator.
ST_FIPS	R	State FIPS. This is the two-digit code that corresponds to the State Federal Information Processing Standard (FIPS) code. This is a standard numbering system used by the Federal government, defined in FIPS Pub 6-4. These two numbers correspond to the first two digits of the panel number. Acceptable values for this field are listed in the D_State_FIPS table.
PCOMM	R	Community or County Identification Number. This is the third through the sixth digits of the panel number. For community based maps this corresponds to the FEMA Community Identification number. For countywide maps this is the county (or county equivalent) FIPS code with a "C."
PANEL	R	Panel Number. This is seventh through the 10th digits in the complete panel number. This is assigned by the scale of the map and the position within the community or county. The panel number scheme is described in detail in <i>Appendix K</i> of these Guidelines.
SUFFIX	R	Map Suffix. This is the final digit in the complete panel number. This is a letter suffix at the end of the panel number. The map suffix is incremented one letter every time the panel gets republished.
FIRM_PAN	R	FIRM Panel Number. This is the complete 11-digit FIRM panel number, which is made up of ST_FIPS, PCOMM, PANEL, and SUFFIX. This is the FIRM panel number that is shown in the title block of the map.

PANEL_TYP	R	Panel Type. The type of FIRM panel identifies whether the panel is printed or not, and whether it is community based or countywide. Acceptable values for this field are listed in the D_Panel_Typ table.
EFF_DATE	A	Effective Date. This is the effective date of the current map revision. This field is not populated until the FIRM effective date is established and the Final FIRM is ready for hardcopy production by FEMA. Then it is required.
SCALE	R	Map Scale. This is the denominator of the FIRM scale as a ratio. For example, 24000 is the denominator for a 1" = 2000' map. Acceptable values for this field are listed in the D_Scale table.
PNP_REASON	A	Panel Not Printed Reason. This is the explanation for the FIRM panels that are not printed. Only completed if the hardcopy panel is not printed by FEMA. For example "No Special Flood Hazard Areas." See <i>Appendix K</i> of these Guidelines for commonly used values.
BASE_TYP	R	Base map type. The type of base map used for the FIRM panel shall be recorded in this field. Acceptable values for this field are listed in the D_Basemap_Typ table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_FIRM\_Pan [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
FIRM_ID	R	Text	25		N/A
ST_FIPS	R	Text	2		N/A
PCOMM	R	Text	4		N/A
PANEL	R	Text	4		N/A
SUFFIX	R	Text	1		N/A
FIRM_PAN	R	Text	11		L_PAN_REVIS L_MT2_LOMR
PANEL_TYP	R	Text	30		D_PANEL_TYP
EFF_DATE	A	Date	Default	0	N/A
SCALE	R	Text	5		N/A
PNP_REASON	A	Text	254		N/A
BASE_TYP	R	Text	20		D_BASEMAP_TYP
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

### L.8.9 Table: S\_Fld\_Haz\_Ar

[October 2011]

This table is required for all Preliminary or Final FIRM Databases.

The S\_Fld\_Haz\_Ar table contains information about the flood hazards within the flood risk project area. A spatial file with location information also corresponds with this data table. These zones are used by FEMA to designate the SFHA and for insurance rating purposes. These data are the regulatory flood zones designated by FEMA. A spatial file with location information also corresponds with this data table.

This information is needed for the following tables in the FIS report: Flooding Sources Included in this FIS report, and Summary of Hydrologic and Hydraulic Analyses.

The spatial elements representing the flood zones are polygons. The entire area of the jurisdiction(s) mapped by the FIRM should have a corresponding flood zone polygon. There is one polygon for each contiguous flood zone designated. Zone AR polygons should not be included in the S\_Fld\_Haz\_Ar layer; these polygons should be included in the S\_Zone\_AR layer.

The S\_Fld\_Haz\_Ar table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
FLD_AR_ID	R	Primary key for table lookup. Assigned by table creator.
STUDY_TYP	R	Study Type. This describes the type of flood risk project performed for flood hazard identification. Acceptable values for this field are listed in the D_Study_Typ table.
FLD_ZONE	R	Flood Zone. This is a flood zone designation. These zones are used by FEMA to designate the SFHAs and for insurance rating purposes. NOTE: The symbol '%' is a reserved symbol in most software packages, so the word 'percent' was abbreviated to 'PCT.' Acceptable values for this field are listed in the D_Zone table. NOTE: AR Zones are now stored in the S_Zone_AR table and include the zone formerly stored in the AR_REVERT field in the 2003 DFIRM Database specification.

ZONE_SUBTY	A	Flood Zone Subtype. This field captures additional information about the flood zones not related to insurance rating purposes. For example, insurance rate zone Shaded X could have “PROTECTED BY LEVEE” or “0.2 PCT ANNUAL CHANCE FLOOD HAZARD CONTAINED IN STRUCTURE.” Types of floodways are also stored in this field. Floodways are designated by FEMA and adopted by communities to provide an area that will remain free of development to moderate increases in flood heights due to encroachment on the floodplain. Normal floodways are specified as ‘FLOODWAY.’ Special cases will have a more specific term for the designation (such as COLORADO RIVER) and will appear as a note on the hardcopy FIRM. See <i>Appendix K</i> of the <i>Guidelines and Standards</i> for available floodway notes. Acceptable values for this field are listed in the D_Zone_Subtype table.
SFHA_TF	R	Special Flood Hazard Area. If the area is within a SFHA this field would be true. This field will be true for any area coded as an A or V flood zone area. It should be false for any X or D flood areas. Acceptable values for this field are listed in the D_TrueFalse table.
STATIC_BFE	A	Static Base Flood Elevation. This field will be populated for areas that have been determined to have a constant Base Flood Elevation (BFE) over a flood zone. The BFE value will be shown beneath the zone label. In this situation the same BFE applies to the entire polygon. This normally occurs in lakes or coastal zones.
V_DATUM	A	Vertical Datum. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally this would be North American Vertical Datum of 1988 for new studies. This field is only populated if the STATIC_BFE field is populated. Acceptable values for this field are listed in the D_V_Datum table.
DEPTH	A	Depth This is the depth for Zone AO areas. This value is shown beneath the zone label on the FIRM. This field is only populated if a depth is shown on the FIRM.
LEN_UNIT	A	Length Units. This unit indicates the measurement system used for the BFEs and/or depths. Normally this would be feet. This field is only populated if the STATIC_BFE or DEPTH field is populated. Acceptable values for this field are listed in the D_Length_Units table.
VELOCITY	A	Velocity. This is the velocity measurement of the flood flow in the area. Normally this is applicable to alluvial fan areas (certain Zone AO areas). This value is shown beneath the zone label on the FIRM. This field is only populated when a velocity is associated with the flood zone area.
VEL_UNIT	A	Velocity Unit. This is the unit of measurement for the velocity. This field is populated when the VELOCITY field is populated. Acceptable values for this field are listed in the D_Velocity_Units table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_Fld\_Haz\_Ar [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
FLD_AR_ID	R	Text	25		N/A
STUDY_TYP	R	Text	30		D_STUDY_TYP
FLD_ZONE	R	Text	55		D_ZONE
ZONE_SUBTY	A	Text	80		D_ZONE_SUBTYPE
SFHA_TF	R	Text	1		D_TRUEFALSE
STATIC_BFE	A	Double	Default	2	N/A
V_DATUM	A	Text	17		D_V_DATUM
DEPTH	A	Double	Default	2	N/A
LEN_UNIT	A	Text	11		D_LENGTH_UNITS
VELOCITY	A	Double	Default	2	N/A
VEL_UNIT	A	Text	17		D_VELOCITY_UNITS
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.10 Table: S\_Fld\_Haz\_Ln****[October 2011]**

This table is required for all Preliminary or Final FIRM Databases.

The S\_Fld\_Haz\_Ln table contains information about the flood zone boundary features for the flood risk project area. A spatial file with location information also corresponds with this data table. Flood hazard data should not be shown beyond the extent of the county/community boundary. If the modeled information extends beyond the political area, the flood hazard data should be clipped to the political boundary. Three types of lines exist. These are: SFHA / FLOOD ZONE BOUNDARY, LIMIT OF DETAILED STUDY / LIMIT OF STUDY, and OTHER BOUNDARY. All lines that are associated with flood hazard zone boundaries are coded in the LN\_TYP field as SFHA / FLOOD ZONE BOUNDARY, with the exception of LIMIT OF DETAILED STUDY / LIMIT OF STUDY lines. OTHER BOUNDARY line types include lines that indicate different source citations, apparent limits, or the end of spatial extents. OTHER BOUNDARY lines are not shown on the FIRM.

The spatial elements representing the boundaries of the flood hazard areas depicted on the FIRM are lines.

The S\_Fld\_Haz\_Ln table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
FLD_LN_ID	R	Primary key for table lookup. Assigned by table creator.
LN_TYP	R	Line Type. These line types describe the flood boundary and may be used to indicate how the feature must be depicted on the hardcopy FIRM. Acceptable values for this field are listed in D_Ln_Typ table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_Fld\_Haz\_Ln [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
FLD_LN_ID	R	Text	25		N/A
LN_TYP	R	Text	45		D_LN_TYP
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.11 Table: S\_Gage****[October 2011]**

S\_Gage table contains information about riverine gages for the flood risk project area. Coastal gages are stored in S\_Cst\_Gage. The spatial location of these gages may be some distance from areas from which flood hazards were determined. A spatial file with location information also corresponds with this data table. This information is needed for the Stream Gage Information Used to Determine Discharges table in the FIS report.

The spatial elements representing this layer are points.

The S\_Gage table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
GAGE_ID	R	Primary key for table lookup. Assigned by table creator.
GAGE_OWNIID	A	Unique Gage ID used by the Gage Owner. For reference purposes, this field should be populated with the unique gage ID used by the gage owner.
WTR_NM	R	Surface Water Feature Name. This is the formal name of the surface water feature associated with the gage.
AGENCY	R	Agency Name. This is the name of the agency responsible for maintaining the gage.
DTA_ACCESS	A	Data Access Information. URL for finding gage data, if available.
GAGE_DESC	R	Gage Description. This provides a description of the gage.
GAGE_TYP	R	Gage Type. This value indicates the type of gage (e.g. precipitation, coastal). Acceptable values for this field are listed in D_Gage_Typ.
REC_INTRVL	A	Recording Interval. This field is populated only if the gage is a fixed-interval gage.
TIME_UNIT	A	Recording Interval Time Unit. This field is populated only if the gage is a fixed-interval. Acceptable values for this field are listed in D_Time_Units.
START_PD	R	Gage Record Starting Date. Start of earliest period of record used in gage analysis.
END_PD	R	Gage Record Ending Date. End of latest period of record used in gage analysis.
DRAIN_AREA	R	Drainage Area. This is the contributing drainage basin area.
AREA_UNIT	R	Area Unit. This unit indicates the measurement system used for drainage area. This would normally be square miles. Acceptable values for this field are listed in D_Area_Units table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

Table: S\_Gage [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
GAGE_ID	R	Text	25		N/A
GAGE_OWNID	A	Text	25		N/A
WTR_NM	R	Text	100		N/A
AGENCY	R	Text	150		N/A
DTA_ACCESS	A	Text	254		N/A
GAGE_DESC	R	Text	100		N/A
GAGE_TYP	R	Text	30		D_GAGE_TYP
REC_INTRVL	A	Text	25		N/A
TIME_UNIT	A	Text	7		D_TIME_UNITS
START_PD	R	Date	8	0	N/A
END_PD	R	Date	8	0	N/A
DRAIN_AREA	R	Double	Default		N/A
AREA_UNIT	R	Text	17		D_AREA_UNITS
SOURCE_CIT	R	Text	11		L_SOURCE_CIT



## L.8.12 Table: S\_Gen\_Struct

[October 2011]

This table is required whenever hydraulic structures are shown in the flood profile. It is also required when channels containing the flooding are shown on the FIRM, or any other structure that impacts the area's flood risk is shown on the FIRM or listed in the FIS report in the Flood Protection Measures in County table. This table contains both riverine and coastal structure types.

The S\_Gen\_Struct table must include all structures shown on the flood profiles, with the exception of riverine or coastal levees, floodwalls, closure structures, and embankments; these types of structures must be placed in S\_Levee, not in S\_Gen\_Struct. Refer to the S\_Levee table for more information. Additional information about coastal structures is placed in L\_Cst\_Struct.

In addition, channels that contain flooding, and other significant flood control structures shown on the FIRM, must be included.

Spatial elements representing general structures are represented by lines. The lines must represent the primary characteristic of the structure. For example, bridges must be represented by the transportation centerline carried by the bridge. Dams must be represented by a line corresponding to the top of the dam. A line corresponding to the centerline of the main barrel must represent a culvert.

The S\_Gen\_Struct table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
STRUCT_ID	R	Primary key for table lookup. Assigned by table creator.
STRUCT_TYP	R	Structure Type. These are hydraulic structures within the flood risk project area. Acceptable values for this field are listed in the D_Struct_Typ table.
CST_STRUCT	A	Coastal Structure Classification. This provides the primary classification of the coastal structure. This field is populated when the structure type is a coastal structure. Acceptable values for this field are listed in the D_Cst_Struct table.
STRUCT_NM	A	Structure Name. This is the proper name of the feature and/or the related transportation feature name as shown on the FIRM and/or the flood profile. If the flood profile has the proper structure name and no related transportation name, this field stores the proper name (e.g., Hoover Dam). If the flood profile has the related transportation name and no proper name, this field stores the related transportation name (e.g., Main Street). If the flood profile has the proper name and the transportation name, this field stores both names (e.g., Hoover Dam / Main Street). If structure has no proper name and no related transportation name, this field is left blank; this field should not store the structure type (e.g., dam).

WTR_NM	R	Surface Water Feature Name. This is the formal name of the surface-water feature associated with the structure, as it will appear on the hardcopy FIRM.
LOC_DESC	A	Location Description. This is a description of where the structure is located. Used in FIS report Flood Protection Measures table, if applicable.
STRUC_DESC	A	Structure Description. This is a description of the structure itself.
SHOWN_FIRM	R	Shown on FIRM. If the structure is shown on the FIRM, this field would be True. If the structure is not shown on the FIRM, this field is False. Acceptable values for this field are listed in D_TrueFalse.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_Gen\_Struct [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
STRUCT_ID	R	Text	25		L_CST_STRUCT
STRUCT_TYP	R	Text	60		D_STRUCT_TYP
CST_STRUCT	A	Text	40		D_CST_STRUCT
STRUCT_NM	A	Text	50		N/A
WTR_NM	R	Text	100		N/A
LOC_DESC	A	Text	254		N/A
STRUC_DESC	A	Text	254		N/A
SHOWN_FIRM	R	Text	1		D_TRUEFALSE
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.13 Table: S\_HWM****[October 2011]**

S\_HWM table contains information about high water marks for the flood risk project area. A spatial file with location information also corresponds with this data table. This table is needed for the Historic Flooding Elevations table in the FIS report, when this information is available.

The spatial entities representing the high water marks are points.

The S\_HWM table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
HWM_ID	R	Primary key for table lookup. Assigned by table creator.
WTR_NM	R	Surface Water Feature Name. This is the formal name of the surface water feature associated with the high water mark.
LOC_DESC	R	Location Description. This provides a description of the location where the water marks were observed.
EVENT_DT	R	Event Date. This is the date the water marks were recorded.
ELEV	R	Elevation. This is the water-surface elevation.
LEN_UNIT	R	Water-Surface Elevation Units. This unit indicates the measurement system used for the water-surface elevation. Normally, this would be feet. Acceptable values for this field are listed in the D_Length_Units table.
V_DATUM	R	Vertical Datum. The vertical datum indicates the reference surface from which the elevation is measured. Normally, this would be NAVD88. Acceptable values for this field are listed in the D_V_Datum table.
HWM_SOURCE	R	Source of Historic Water Mark Data. Brief description of the source of the high water mark data.
APX_FREQ	R	Approximate recurrence interval in years, of the high water event associated with this high water event.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_HWM [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
HWM_ID	R	Text	25		N/A
WTR_NM	R	Text	100		N/A
LOC_DESC	R	Text	254		N/A
EVENT_DT	R	Date	Default		N/A
ELEV	R	Double	Default	2	N/A
LEN_UNIT	R	Text	11		D_LENGTH_UNITS
V_DATUM	R	Text	17		D_V_DATUM
HWM_SOURCE	R	Text	100		N/A
APX_FREQ	R	Short Integer	Default		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.14 Table: S\_Hydro\_Reach****[October 2011]**

The table is required for all hydrologic analyses. The hydrologic reach represents the connectivity between the subbasins and the flow direction between nodes in the hydrologic model.

The spatial entities representing the hydrologic reaches are lines.

The S\_Hydro\_Reach layer contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
REACH_ID	R	Primary key for table lookup. Assigned by table creator.
UP_NODE	A	Upstream Node. This is the node ID at the upstream end of the reach. This field must contain a number that matches the NODE_ID field in the S_Nodes table, which documents points used to define the topology of the hydrologic network. This field is populated when the feature is associated with an upstream node.
DN_NODE	A	Downstream Node. This is the node ID at the downstream end of the reach. This field must contain a number that matches the NODE_ID field in the S_Nodes table, which documents points used to define the topology of the hydrologic network. This field is populated when the feature is associated with an upstream node.
ROUTE_METH	A	Hydrologic Routing Method. This is the hydrologic routing method used for the reach. This field is populated if hydrologic routing is used for the reach.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature.

**Table: S\_Hydro\_Reach [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
REACH_ID	R	Text	25		N/A
UP_NODE	A	Text	25		S_NODES
DN_NODE	A	Text	25		S_NODES
ROUTE_METH	A	Text	254		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.15 Table: S\_Label\_Ld****[October 2011]**

This table is required for FIRM data if any label leader lines are shown on the hardcopy FIRM.

The S\_Label\_Ld table contains information about leader lines that would connect labels to feature locations. The purpose of this table, along with the S\_Label\_Pt table is so that the FIRM Database can contain all labels and notes shown on the FIRM panel. A spatial file with location information also corresponds with this data table.

The spatial entities representing label leaders will be lines.

The S\_Label\_Ld table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
LEADER_ID	R	Primary key for table lookup. Assigned by table creator.
LABEL_TYPE	R	Label type. This is a description of the features to which the leaders are associated. This field contains information for all labels and notes shown in the FIRM panel map body. Acceptable values for this field are listed in the D_Label_Typ table.

**Table: S\_Label\_Ld [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
LEADER_ID	R	Text	11		N/A
LABEL_TYPE	R	Text	20		D_LABEL_TYP

**L.8.16 Table: S\_Label\_Pt****[October 2011]**

This table is required for all Preliminary or Final FIRM Databases.

The S\_Label\_Pt table contains information for point locations that would link labels to base map features. The purpose of this table, along with the S\_Label\_Ld table is so the FIRM Database can contain the names of all features and annotation needed to make the FIRM panel. A spatial file with location information also corresponds with this data table.

The spatial entities representing labels are points. The point corresponds to the lower left corner of the label and notes.

The S\_Label\_Pt table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
LABEL_ID	R	Primary key for table lookup. Assigned by table creator.
LABEL	R	Label for map feature.
LABEL2	A	Label continued if the note placed on the map exceeds the maximum field length of LABEL.
LABEL_TYPE	R	Label type. This is a description of the features to which the labels are associated. This field contains information for all labels and notes shown in the FIRM panel map body. Acceptable values for this field are listed in the D_Label_Typ table.
FONT_SIZE	R	Font Size. Lists the font size for each feature as it is placed in the map body of a FIRM panel.
FONT_TYPE	R	Font Type. Lists the font used to display a feature in the map body of a FIRM panel. Acceptable values for this field are listed in the D_Font table.
DEGREES	R	The degrees of rotation required for the placement of a feature label onto a FIRM panel. The rotation angle of the text measured in degrees. The angle is zero for unrotated horizontal text and increases in a counterclockwise direction to 359. Text rotated clockwise has a negative value between 0 and -359.
FIRM_PAN	R	FIRM Panel Number. This is the complete 11-digit FIRM panel number, which is made up of ST_FIPS, PCOMM, PANEL, and SUFFIX. This is the FIRM panel number on which the label falls.
SCALE	R	Map Scale. This is the denominator of the FIRM scale as a ratio. For example, 24000 is the denominator for a 1" = 2000' map. Acceptable values for this field are listed in the D_Scale table.

Table: S\_Label\_Pt [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
LABEL_ID	R	Text	25		N/A
LABEL	R	Text	254		N/A
LABEL2	A	Text	100		N/A
LABEL_TYPE	R	Text	20		D_LABEL_TYP
FONT_SIZE	R	Text	3		N/A
FONT_TYPE	R	Text	22		D_FONT
DEGREES	R	Short Integer	Default		N/A
FIRM_PAN	R	Text	11		N/A
SCALE	R	Text	5		N/A



**L.8.17 Table: S\_Levee****[October 2011]**

This table is required for any Preliminary or Final FIRM Databases that include levees, floodwalls, and levee closure structures. Berms, embankments, and dikes may also be included if they meet the NFIP requirements in 44 CFR 65.10. This information is shown in the Levees table in the FIS report and on the FIRM panels.

The S\_Levee table contains information about levees shown on the FIRMs that are accredited and known to be protecting against the 1-percent-annual-chance flood, as well as levees that are provisionally accredited, de-accredited, and never accredited. The purpose of this table is to document the accreditation status of levees, as well as associated information necessary to be shown on the FIRM and for the population of FIS report text related to levee structures.

The spatial entities representing levees are lines, drawn at the centerline of levees, floodwalls, and levee closure structures.

The S\_Levee table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
LEVEE_ID	R	Primary key for table lookup. Assigned by table creator.
FC_SYS_ID	R	Levee System ID. An identifier for each levee system with which a levee is associated. Used to associate levees with areas protected by a levee.
LEVEE_NM	R	Any commonly used name for the levee.
LEVEE_TYP	R	Describes the type of protecting structure. Valid values can be found in the D_Levee_Type domain table.
WTR_NM	R	Surface Water Feature Name. Name of the water body that the levee structure or segment is providing protection from.
BANK_LOC	R	Bank Location of Levee. A field to describe the location of the levee centerline in relation to the water body. For example, "Left Bank," "Right Bank."
USACE_LEV	R	Determines if this is a U.S. Army Corps of Engineers (USACE) Levee. Valid values can be found in the D_TrueFalse domain table.
DISTRICT	A	USACE District Code. This is the code for the USACE district responsible for the segment. Field is required when the structure is owned or maintained by the USACE. Valid values can be found in the D_USACE_District domain table.
PL84_99TF	R	Status of levee. This field indicates if the levee is covered under PL84-99, which is the USACE authority to provide emergency assistance and repair damaged levees. Valid values can be found in the D_TrueFalse domain table.
CONST_DATE	A	Construction Date. Date on which construction was completed.

PROT_1PCT	R	Protection from 1-percent-Annual-Chance Flood Hazard. Indicates if the structure provides protection from the 1-percent-annual-chance flood hazard. Valid values can be found in the D_TrueFalse domain table. Use the “U” domain value if the levee is Provisionally Accredited.
DGN_FREQ	R	Design Frequency. Enter the design frequency of the levee.
FREEBOARD	R	Freeboard Value. Enter the smallest amount of freeboard above the 1-percent-annual-chance flood along the entire levee, floodwall, closure structure or embankments.
LEVEE_STAT	R	Levee Status. This field stores the accreditation status of the levee. Acceptable values for this field are listed in the D_Levee_Status table. The domain value “NEVER ACCREDITED” indicates that the levee provides some flood protection but does not provide protection for the 1-percent-annual-chance flood event; this value may only be used with the approval of the FEMA Project Officer.
PAL_DATE	A	Provisionally Accredited Levee Date. This field stores the end date of the Provisionally Accredited Levee (PAL) period for the levee associated with the flood zone. This field is populated for those structure features that have a PAL designation.
LVDBASE_ID	A	Midterm Levee Database Identification. If the levee, floodwall, or closure structure is included in the Midterm Levee Database, this is the structure’s identification name/number in the Midterm Levee Database. This field is populated for all these structures, included in the Midterm Levee Database, regardless of their status.
OWNER	R	Levee Owner. Name of the entity that owns the levee.
LEN_UNIT	R	This unit indicates the measurement system used for the freeboard elevations. Normally this would be feet. Acceptable values for this field are listed in the D_Length_Units table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_Levee [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
LEVEE_ID	R	Text	25		N/A
FC_SYS_ID	R	Text	25		N/A
LEVEE_NM	R	Text	100		N/A
LEVEE_TYP	R	Text	25		D_LEVEE_TYPE
WTR_NM	R	Text	100		N/A
BANK_LOC	R	Text	100		N/A
USACE_LEV	R	Text	1		D_TRUEFALSE
DISTRICT	A	Text	15		D_USACE_DISTRICT
PL84_99TF	R	Text	1		D_TRUEFALSE
CONST_DATE	A	Date	8	0	N/A
PROT_1PCT	R	Text	1		D_TRUEFALSE
DGN_FREQ	R	Text	50		N/A
FREEBOARD	R	Double	Default		N/A
LEVEE_STAT	R	Text	25		D_LEVEE_STATUS
PAL_DATE	A	Date	Default	0	N/A
LVDBASE_ID	A	Text	25		N/A
OWNER	R	Text	100		N/A
LEN_UNIT	R	Text	11		D_LENGTH_UNITS
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.18 Table: S\_LiMWA****[October 2011]**

This table is required for all Preliminary or Final FIRM Databases that show coastal Limit of Moderate Wave Action (LiMWA) features. Reference *FEMA Procedure Memorandum No. 50* for additional information.

The S\_LiMWA layer is required when a Limit of Moderate Wave Action (LiMWA, previously described as a Coastal Zone A boundary line) is delineated within the coastal floodplain. This layer is required for new coastal analysis.

The spatial entities representing the LiMWA are lines. The line represents the limit of 1.5-foot or greater waves in a Coastal AE Zone.

The S\_LiMWA table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
LIMWA_ID	R	Primary key for table lookup. Assigned by table creator.
SHOWN_FIRM	R	LiMWA Line Shown On FIRM. This field indicates if the LiMWA line feature is shown on the FIRM. This field is true when the line is shown and false when the line is not shown. Acceptable values for this field are listed in the D_TrueFalse table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_LiMWA [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
LIMWA_ID	R	Text	25		N/A
SHOWN_FIRM	R	Text	1		D_TRUEFALSE
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.19 Table: S\_LOMR****[October 2011]**

This table is maintained only in the National Flood Hazard Layer (NFHL) database. It is not part of mapping partners' Preliminary or Effective FIRM Database submittals. Mapping partners must submit the L\_MT2\_LOMR table for any Letters of Map Revision (LOMRs) incorporated into a Preliminary or Effective FIRM in order to populate the Letters of Map Revision table in the FIS report.

This table is not prepared by mapping partners, but by the FEMA contractors responsible for maintaining the NFHL database. This layer incorporates the results of effective LOMRs into FIRM data submitted to FEMA, and is stored in the NFHL database for future PMRs.

The S\_LOMR layer includes all LOMRs that have been incorporated into the NFHL database. The S\_LOMR feature class should contain at least one record for each LOMR incorporated into the NFHL. Multipart polygons are not allowed.

The spatial entities representing LOMRs are polygons. The spatial information contains the bounding polygon for each LOMR area, broken on panel boundaries.

The S\_LOMR table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
LOMR_ID	R	Primary key for table lookup. Assigned by table creator.
EFF_DATE	R	Effective Date. Effective date of the LOMR.
CASE_NO	R	Case Number. This is the case number of the LOMR that is assigned by FEMA. The case number is used to track the LOMR's supporting documentation. Hyphens are included (e.g., 11-03-0036P).
SCALE	R	Map Scale. This is the denominator of the effective LOMR scale as a ratio. For example, 24000 is the denominator for a 1" = 2000' map. Acceptable values for this field are listed in the D_Scale table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.
STATUS	R	Status of the LOMR. Acceptable values for this field are listed in the D_Lomc_Status table.

Table: S\_LOMR [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	15		N/A
VERSION_ID	R	Text	11		N/A
LOMR_ID	R	Text	11		N/A
EFF_DATE	R	Date	Default	0	N/A
CASE_NO	R	Text	13		N/A
SCALE	R	Text	5		D_SCALE
SOURCE_CIT	R	Text	11		L_SOURCE_CIT
STATUS	R	Text	12		D_LOMC_STATUS

## L.8.20 Table: S\_Nodes

[October 2011]

The S\_Nodes layer is required for hydrologic analyses where nodes were defined as part of the analysis. The contributing drainage area and the discharges for all frequencies required for the flood risk project (e.g. the 10-percent, 2-percent, 1-percent, and 0.2-percent-annual-chance floods) represent the discharges based on the cumulative upstream drainage area. The points or nodes must lie on the profile baseline, which resides in S\_Wtr\_Ln or S\_Profil\_Basln. Nodes can represent sub basin outlets, junctions, structures, or diversions. Note that nodes are required at all flow change locations. This information is used in the following tables in the FIS report: Summary of Discharges, Summary of Summary of Non-Coastal Stillwater Elevations, and Flood Hazard and Non-Encroachment Data for Selected Streams.

For hydraulic models that use nodes, such as SWMM or ICPR, the nodes can be used to represent structures or hydraulic elements. In these cases, the nodes and the profile baseline file are used to represent the hydraulic connectivity of the network. Nodes can also represent more detailed inventory, such as manholes or curb inlets. For situations where cross sections are not integral to modeling, the cross section spatial file should not be submitted, and the water-surface elevations must be reported in the L\_Summary\_Elevations file.

The spatial entities representing nodes are points.

The S\_Nodes layer contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
NODE_ID	R	Primary key for table lookup. Assigned by table creator.
NODE_TYP	A	Node Type. Values include junction (default), structure, outlet, and diversion. This field is required when the node is utilized in the hydraulic model. Acceptable values for this field are listed in the D_Node_Typ table.
WTR_NM	R	Surface Water Name. This is the name of the flooding source.
NODE_DESC	R	Node Location Description. This describes the location of the node. This name must match what is used in the model and is what will be shown in the Summary of Discharges Table in the FIS report Text. Must be unique across a watershed. Examples of this value include "Downstream of State Route 234," "At the confluence of Hillton Run," and "Approximately 1.08 miles upstream of confluence with McIntosh Run."
MODEL_ID	R	Model Identifier. This field stores the feature's identifier that was used during hydrologic and hydraulic modeling. This field provides a link between the hydrologic or hydraulic modeling and this spatial file.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_Nodes [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
NODE_ID	R	Text	25		L_SUMMARY_DISCHARGES L_SUMMARY_ELEVATIONS S_HYDRO_REACH S_SUBBASINS
NODE_TYP	A	Text	20		D_NODE_TYP
WTR_NM	R	Text	100		N/A
NODE_DESC	R	Text	100		N/A
MODEL_ID	R	Text	100		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT



**L.8.21 Table: S\_PFD\_Ln****[October 2011]**

The S\_PFD\_Ln layer is required when a primary frontal dune (PFD) is present along portions or the entire coastline within the modeled coastal floodplain. PFDs are not required to be continuous along the length of the studied shoreline. The S\_PFD\_Ln spatial file contains information about the PFD features for the coastal flood risk project area. PFDs are not shown on the FIRM but are used in the coastal floodplain analysis. This layer is required for new coastal analysis and redelineations.

The spatial entities representing the PFDs are lines that represent the landward dune heel or where the gradient changes from steep to gentle.

The S\_PFD\_Ln table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
PFD_ID	R	Primary key for table lookup. Assigned by table creator.
VZONE_LIMT	R	Limit of V Zone. This field indicates if the Zone V(E) limit is based on the PFD. This field is true when the PFD determines the Zone V(E) limit and is false when the PFD is not the controlling factor of the Zone V(E) limit. Acceptable values for this field are listed in the D_TrueFalse table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_PFD\_Ln [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
PFD_ID	R	Text	25		N/A
VZONE_LIMT	R	Text	1		D_TRUEFALSE
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.22 Table: S\_PLSS\_Ar****[October 2011]**

This table is required when U. S. Public Land Survey System (PLSS) areas are shown on the FIRM.

The S\_PLSS\_Ar table contains information about the PLSS areas that are associated within the flood risk project area. These include the attributes for the range, township, and section areas. A spatial file with location information also corresponds with this data table.

The spatial elements representing the PLSS areas are polygons. Generally, there is one polygon per section. The PLSS areas should cover the entire jurisdiction where sections are defined.

This information is provided for reference on the paper maps.

The S\_PLSS\_Ar table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
PLSS_AR_ID	R	Primary key for table lookup. Assigned by table creator.
RANGE	A	Range Number. This is the range number assigned to the PLSS area shown. This attribute would also include the designation of E (east) or W (west) as part of the data. For example, 21W would be an acceptable value. This field is applicable whenever the SECT_NO does not equal zero.
TWP	A	Township. This is the township number assigned to the PLSS area shown. This attribute would also include the designation of N (north) or S (south) as part of the data. For example, 14S would be an acceptable value. This field is applicable whenever the SECT_NO does not equal zero.
SECT_NO	R	Section. This is the section number assigned to the PLSS area shown. Use 0 for special cases.
NAME	A	Land Grant or Other Name. This field is required when an area within the PLSS is designated as a Land Grant or has an otherwise special designation.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

Table: S\_PLSS\_Ar [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
PLSS_AR_ID	R	Text	25		N/A
RANGE	A	Text	8		N/A
TWP	A	Text	8		N/A
SECT_NO	R	Text	4		N/A
NAME	A	Text	254		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.23 Table: S\_Pol\_Ar****[October 2011]**

This table is required for all Preliminary or Final FIRM Databases.

The S\_Pol\_Ar table contains information about political areas within the flood risk project area. This includes the attributes for the political areas within the flood risk project, and whether or not they have been studied or participate in the NFIP. For the NFIP, it is important to know the jurisdiction that has land-use authority over an area. Political jurisdictions individually agree to participate in the NFIP and the availability of insurance, floodplain regulations, and insurance rates may vary by political jurisdiction. The political jurisdiction assigned to each area corresponds to the jurisdiction responsible for NFIP and floodplain management for that area.

This table is used in following FIS report components: the FIS report cover, the FIRM panel index, the Panel Locator on the FIRM panels, the Transect Locator Map, and the following tables in the FIS report: Listing of NFIP Jurisdictions, Flooding Sources Included this FIS report, Flood Zone Designations by Community, Levees, Transect Locator Map, Summary of Topographic Elevation Data Used in Mapping, Community Map History, Summary of Contracted Studies Included in this FIS report, and Community Meetings.

The spatial entities representing political areas are polygons.

The S\_Pol\_Ar table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
POL_AR_ID	R	Primary key for table lookup. Assigned by table creator.
POL_NAME1	R	Political Area Name 1. This is the name of the area with floodplain management jurisdiction, which must have a CID. For areas that have more than one name, this would be the primary name with subsequent names shown in field below. This corresponds to the official name of this jurisdiction used by FEMA in the NFIP. For unincorporated areas of a county, this must be the county name (e.g., Montgomery County).
POL_NAME2	A	Political Area Name 2. This is the secondary name of the area shown populated if there is a common name for an area other than the official jurisdiction name.
POL_NAME3	A	Political Area Name 3. This is the tertiary name of the area shown populated if there is a situation where islands, National Parks, National Forests, military bases, or other area boundaries and labels need to be shown on the FIRM underneath the POL_NAME1 and POL_NAME2 labels.
CO_FIPS	R	County Federal Information Processing Standard (FIPS) Code. This is the three-digit county FIPS code. This is a standard numbering system that is used by the Federal government. Defined in FIPS Pub 6-4.

ST_FIPS	R	State FIPS. This is the two-digit code that corresponds to the State FIPS code. This is a standard numbering system that is used by the Federal government defined in FIPS Pub 6-4. These two numbers correspond to the first two digits of the panel number. Acceptable values for this field are listed in the D_State_FIPS table.
COMM_NO	R	Community Number. This is the four-digit number assigned by FEMA to each community for tracking purposes under the NFIP. On newer FIRMs the State FIPS and the community number appear below the community name where it is shown in the body of the map. For single-jurisdiction FIRMs, this is the third through the sixth digits of the panel number. This number can be obtained from the Community Status Book at <a href="http://www.msc.fema.gov">www.msc.fema.gov</a> .
CID	R	Community Identification Number. This is the six-digit community number assigned by FEMA. It is created by combining the State FIPS code with the COMM_NO. If the jurisdiction does not have a community number assigned by FEMA, the CID is created by combining the State FIPS code with the abbreviation contained in the COMM_NO field (FED, ST, or OTHR).
ANI_TF	R	Area Not Included (ANI). This field contains information about the geographical area to determine whether or not it is included on the FIRM. Areas Not Included fall within the extent of the FIRM, but no flood risk information is shown. This is either because the area is mapped on another FEMA map or because the area is not mapped at all by FEMA. Enter true when the area is not included in the FIRM. Acceptable values for this field are listed in the D_TrueFalse table.
ANI_FIRM	A	Used for ANI polygons where ANI_TF equals "T" and where the data are included in another FIRM Database, usually because it is a multicounty community. Enter the DFIRM_ID of the FIRM Database that contains the SFHA data of the ANI community. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Populate with "NP" if the area has never been converted to a FIRM Database from paper FIRM format.
COM_NFO_ID	A	Community Information Identification. This attribute links to the table L_Comm_Info that contains information about the specific community. This table must contain a number that matches a corresponding number in the COM_NFO_ID field of the L_Comm_Info table. This field is populated for any jurisdiction that has a CID number issued by FEMA.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

Table: S\_Pol\_Ar [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
POL_AR_ID	R	Text	25		N/A
POL_NAME1	R	Text	50		N/A
POL_NAME2	A	Text	50		N/A
POL_NAME3	A	Text	50		N/A
CO_FIPS	R	Text	3		N/A
ST_FIPS	R	Text	2		D_STATE_FIPS
COMM_NO	R	Text	4		N/A
CID	R	Text	6		L_POL_FHBM
ANI_TF	R	Text	1		D_TRUEFALSE
ANI_FIRM	A	Text	6		N/A
COM_NFO_ID	A	Text	25		L_COMM_INFO
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.24 Table: S\_Profil\_Basln****[October 2011]**

The S\_Profil\_Basln layer is required for all types of riverine hydraulic analyses. Profile baselines are required to be shown on FIRM panels for all valid studies with profiles or otherwise established Base Flood Elevations. At the discretion of the FEMA Project Officer water lines may be shown on vector maps to represent the bank or stream centerline location. When a profile baseline and water lines are available for the same stream reach, only the profile baseline shall be shown on the FIRM in order to eliminate overlaps. A profile baseline is also required when a flood risk project is not being updated, but the effective profile baseline still accurately represents conditions on the ground.

The profile baseline shows the path of flood flows on the FIRM and is an accurate representation of the distance between cross sections, structures, nodes, or grids in the hydraulic model. If the flood flow path follows the main channel of the stream, then the profile baseline and stream centerline will match, but only the profile baseline should be shown on the FIRM. The profile baseline is used for replicating the stationing and water-surface elevations found in the FIS report profiles, but in GIS format. This information is used in the following tables within the FIS report: Flooding Sources Included in this FIS report, Principal Flood Problems, Summary of Hydrologic and Hydraulic Analyses, Summary of Topographic Elevation Data Used in Mapping, the Stream-by\_Stream Vertical Datum Conversion, and Summary of Contracted Studies Included in this FIS Report.

The spatial entities representing the profile baseline are lines. Profile baselines are to be stored in Polyline ZM feature classes, storing both profile station values (M-values) and 1-percent-annual-chance water-surface elevations (Z-values) at cross sections, structures, and other modeled inflection points. For new models and effective models with valid profile baselines, vertices along the profile baseline are to be calibrated between cross sections and structures using linear referencing / dynamic segmentation tools in GIS. The first vertex of each profile baseline will be the downstream most point on the profile.

This table stores Principal Flood Problem and Special Consideration data for use in the FIS text. Due to the limitations in the Esri Shapefile DBF format, text fields are limited in size. Several fields have been provided, but in the event that the description of principal flood problems or special considerations exceeds the number of characters provided, a tab separated value text file may be submitted instead. The first row of the text file must include a header as follows:

*WTR\_NM* <TAB> *FLD\_PROB* <TAB> *SPEC\_CON* <CR>

Each row after the header would have the name of the studied reach/stream followed by a tab, the principal flood problem text followed by a tab, and special considerations for that reach, followed by a carriage return.

When required, principal flood problem and special consideration files will be named using the following convention: <DFIRM\_ID>\_FIS\_Fld\_Problems\_Spec\_Considerations.txt

The S\_Profil\_Basln table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
BASELN_ID	R	Primary key for table lookup. Assigned by table creator.
WTR_NM	R	Surface Water Feature Name. This is the formal name of the surface water feature as it will appear on the hardcopy FIRM.
SEGMT_NAME	A	Segment Name. This is an optional identification string for each link. If used, this value must be unique for a stream.
WATER_TYP	R	Surface Water Feature Type. The type value describes the kind of watercourse represented. In the FIRM Database, this layer contains profile baselines and/or streams that are coincident with profile baselines. Acceptable values for this field are listed in the D_Prof_Basln_Typ table.
STUDY_TYP	R	Study Type. This describes the type of flood risk project performed for flood hazard identification. Acceptable values for this field are listed in the D_Study_Typ table.
SHOWN_FIRM	R	Profile Baseline Shown on FIRM. This field is true only if the profile baseline is shown on the FIRM. Because various FIS tables require a profile baseline for all studied reaches regardless of zone designation, this field must be populated to determine which profile baselines are to be shown on the FIRM panels. Acceptable values for this field are listed in the D_TrueFalse table.
INTER_ZONE	R	Intersecting Flood Zone. This field shall be populated with the type of flood hazard zone it lies within. Profile baselines are usually only created on riverine studies mapped as Zone AE or sometimes Zone A with model backup. In rare circumstances there may be other zone types which intersect profile baseline. The acceptable values for this field can be found in D_Intersect_Zone table.
R_ST_DESC	R	Reach Name Start Description. This describes the location of the start of the flood risk project reach.
R_END_DESC	R	Reach Name End Description. This describes the location of the end of the flood risk project reach.
V_DATM_OFF	A	Vertical Datum Offset. Populated if a single vertical datum offset cannot be used across the flood risk project and offset values must be calculated stream by stream.
DATUM_UNIT	R	Length Units. This is the unit of measure for the vertical datum offset distance height. Acceptable values for the field are listed in the D_Length_Units table.
FLD_PROB1	A	Description of Flooding Problems by flooding source.
FLD_PROB2	A	Description of Flooding Problems by flooding source, continued. Used when FLD_PRB1 field does not have enough characters to hold the flooding problem description.



FLD_PROB3	A	Description of Flooding Problems by flooding source, continued. Used when FLD_PRB1 and FLD_PRB2 fields do not have enough characters to hold the flooding problem description.
SPEC_CONS1	A	Special Considerations field for describing the modeling methodology used.
SPEC_CONS2	A	Second Special Considerations field for describing the modeling methodology used. Use this field when the description cannot be contained within the SPEC_CONS1 field.
START_ID	R	Station Start Identification. This is the foreign key to the S_Stn_Start layer. This field is the link that is used to reference station start descriptions in the FDTs and profiles, and which links the S_Profil_Basln table, L_XS_Elev table via the S_XS table, and river marks in the S_Riv_Mrk table to the appropriate stationing starting point.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_Profil\_Basln [October 2011]**

Field	R/A	Type	Length/ Precision	Scale(SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
BASELN_ID	R	Text	25		N/A
WTR_NM	R	Text	100		N/A
SEGMT_NAME	A	Text	254		N/A
WATER_TYP	R	Text	40		D_PROF_BASLN_TYP
STUDY_TYP	R	Text	30		D_STUDY_TYP
SHOWN_FIRM	R	Text	1		D_TRUEFALSE
INTER_ZONE	R	Text	10		D_INTERSECT_ZONE
R_ST_DESC	R	Text	254		N/A
R_END_DESC	R	Text	254		N/A
V_DATM_OFF	A	Text	6		N/A
DATUM_UNIT	A	Text	11		D_LENGTH_UNITS
FLD_PROB1	A	Text	254		N/A
FLD_PROB2	A	Text	254		N/A
FLD_PROB3	A	Text	254		N/A
SPEC_CONS1	A	Text	254		N/A
SPEC_CONS2	A	Text	254		N/A
START_ID	R	Text	25		S_STN_START
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.25 Table: S\_Riv\_Mrk****[October 2011]**

This table is required if the FIRM shows river distance marks.

The S\_Riv\_Mrk table contains information about the river marks shown on the FIRM if applicable. A spatial file with location information also corresponds with this data table.

The spatial entities representing the river marks are points. The points are generally located along the centerline of the river at regular intervals, or as indicated by the data source.

The S\_Riv\_Mrk table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
RIV_MRK_ID	R	Primary key for table lookup. Assigned by table creator.
START_ID	R	Station Start Identification. This is the foreign key to the S_Stn_Start layer. A code that provides a link to a point in the S_Stn_Start table at which the river mark distances start.
RIV_MRK_NO	R	River Mark Number. This attribute usually represents the distance from a known point (identified by START_ID), such as the confluence with another river, to the current river mark. This is the value shown next to the river mark on the FIRM.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_Riv\_Mrk [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
RIV_MRK_ID	R	Text	25		N/A
START_ID	R	Text	25		S_STN_START
RIV_MRK_NO	R	Text	6		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.26 Table: S\_Stn\_Start****[October 2011]**

This table is required for any FIRM Database that has an S\_Profil\_Basln, S\_Riv\_Mrk, or L\_XS\_Elev table. It is used to populate the Floodway Data Tables and Flood Profiles, as well as the Flood Hazard and Non-Encroachment Data for Selected Streams table in the FIS report.

The S\_Stn\_Start table contains information about station starting locations. These locations indicate the reference point that was used as the origin for distance measurements along streams and rivers. This table is referenced by both the L\_XS\_Elev table, which contains stream station information for cross sections, and the S\_Riv\_Mrk table, which contains river distance marker points. The location of the stationing start for a group of cross sections is normally referenced as a note on the Floodway Data Table and on the Flood Profiles. Generally, all of the cross sections for a particular reach are referenced to the same starting point. If multiple reaches are measured from the same point, they may share the same record in S\_Stn\_Start. S\_Stn\_Start points are snapped to the downstream end of the corresponding S\_Profile\_Basln feature, if the station start exists within the study area.

The S\_Stn\_Start table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
START_ID	R	Primary key for table lookup. Assigned by table creator. This field is the link that is used to reference station start descriptions in the FDTs and profiles, and which links the S_PROFIL_BASLN table, L_XS_ELEV table via the S_XS table, and river marks in the S_Riv_Mrk table to the appropriate stationing starting point.
START_DESC	R	Start Description. The description of the location of the station starting point. This should include the measurement units. For example, "Distances are measured in feet upstream from the confluence with the Main Channel of the Big River."
LOC_ACC	R	Start Station Locational Accuracy. The spatial placement accuracy level of the Station Start point. For all new models with profile baselines, the exact location of the profile baseline station start should be placed and the locational accuracy be categorized as "HIGH." For old models where the profile baseline and station start are documented on work maps, the locational accuracy is "MEDIUM." For areas that only have a text description, the point shall be placed as best possible, and the locational accuracy will be attributed as "LOW." The acceptable values for this field can be found in the D_Loc_Accuracy table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

Table: S\_Stn\_Start [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
START_ID	R	Text	25		S_PROFIL_BASLN S_XS S_RIV_MRK
START_DESC	R	Text	254		N/A
LOC_ACC	R	Text	6		D_LOC_ACCURACY
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.27 Table: S\_Subbasins****[October 2011]**

This table is required for all studies with new or revised hydrologic data.

The S\_Subbasins table contains data specific to each subbasin in the hydrologic analysis, including the relationship of the subbasin to the hydrologic network. The subbasin may be specific to a detailed hydrologic model. It may also correspond to the drainage area used in a regression analysis, or to the drainage area for a stream gage. S\_Subbasins is intended to store HUC8 information related to the hydrologic model. This information is used in the Basin Characteristics tables in the FIS report, as well as for the FIRM Panel Index Map.

The spatial elements representing the subbasins are polygons. In some cases the extent of these polygons may overlap, for example, cumulative subbasin areas for a regression analysis.

The S\_Subbasins table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
SUBBAS_ID	R	Primary key for this table. Assigned by table creator.
SUBBAS_NM	R	Name of subbasin.
HUC8	R	Number of subbasin. USGS HUC8 code.
WTR_NM	R	Surface Water Feature Name. This is the name of the primary flooding source drained by the subbasin.
BASIN_DESC	R	Subbasin description. Enter a descriptive phrase for the subbasin.
SUB_AREA	R	Area of subbasin.
AREA_UNIT	R	Area Unit. This unit indicates the measurement system used for the subbasin area. This would normally be square miles. Acceptable values for this field are listed in D_Area_Units table.
NODE_ID	A	Node Identification. This is the foreign key to the S_NODES table. The node is associated with the subbasin.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_Subbasins [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
SUBBAS_ID	R	Text	25		N/A
SUBBAS_NM	R	Text	254		N/A
HUC8	R	Text	8		N/A
WTR_NM	R	Text	100		N/A
BASIN_DESC	R	Text	254		N/A
SUB_AREA	R	Double	Default		N/A
AREA_UNIT	R	Text	17		D_AREA_UNITS
NODE_ID	A	Text	25		S_NODES
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.28 Table: S\_Submittal\_Info****[October 2011]**

The S\_Submittal\_Info layer contains essential information about the flood risk project such as the FEMA case number and utilized engineering models. In each data development task, the table was populated and submitted by the mapping partner as part of the DCS submission (see *Appendix M* of these Guidelines for additional information). The mapping partner responsible for the FIRM Database shall compile the features from the individual DCS submissions into a single layer in the FIRM Database. Only those areas that were revised and were part of the DCS submission would be represented in the table; in the FIRM Database creation process the mapping partner is not responsible for creating features that were not submitted with the various DCS submissions. The features will help users identify the FEMA case number for the various studies so that the engineering data may be easily located on the MIP.

The spatial entities representing the flood risk project areas are polygons corresponding to the area to be revised by this case / the area covered by the FIRM being revised / the area where new hydraulic analyses are to be performed and/or the watershed boundaries of the catchments analyzed. These can be one or multiple irregular polygons that capture the extent of the flood risk project area(s). If multiple polygons are required, the attributes of each polygon should be set appropriately for the area covered, and all polygons for that project should contain the same FEMA case number. Multiple polygons may be needed, for instance, when a mapping partner performs hydraulic analyses for two streams, each with a different type of hydraulic model. A single polygon would be created for each of the flood risk project areas and the polygon's attribute values would store the related model information. In most cases, there will be multiple S\_Submittal polygons for the same flood risk project area. For example, there will often be overlapping polygons for Topographic Data Development, Perform Survey, Perform Hydrologic Analysis, and Perform Hydraulic Analyses. The shapes of these will be different based on the different extents of the Data Development task. In cases where the flood hazards for the entire county or community included in the FIRM have been re-delineated and no new/updated flood risk project information was created, a single polygon that matches the extent of the S\_Pol\_Ar polygon shall be created. For the case where the flood hazards for a given FIRM were from both new or updated flood risk project data and re-delineated areas, the polygon(s) for the re-delineated areas should not overlap the polygons for the new flood risk project areas, and the outer edges should not extend beyond the S\_Pol\_Ar polygon for the FIRM. This information is used in the following tables in the FIS report: Summary of Contracted Studies Included in this FIS report, Summary of Hydrologic and Hydraulic Analyses, and Summary of Topographic Elevation Data Used in Mapping.

The S\_Submittal\_Info is a polygon layer that contains the following elements:

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
SUBINFO_ID	R	Primary key for table lookup. Assigned by table creator.

CASE_NO	R	FEMA Case Number. The FEMA case number is an alphanumeric identifier for a project that is generated by the MIP. An example of a FEMA case number for a flood risk project is 10-03-0002S. Hyphens are to be included.
CASE_DESC	R	Case Description. General description of the flood risk project area outlining the extent of work performed. This description should include the flood risk project location with limits of flood risk project, methods used, and any unique circumstances associated with this flood risk project (e.g., This is a redelineation of the East River using USGS DEMs.).
SUBMIT_BY	R	Data Submitter. Company name of the mapping partner submitting the dataset.
HUC8	A	USGS HUC8 Code. This is the unique eighth-digit hydrologic unit code based on USGS levels of classification in the hydrologic unit system. This field is required when the data development task is not COASTAL.
STUDY_TYP	R	Study Type. This describes the type of flood risk project performed for flood hazard identification. Acceptable values for this field are listed in the D_Study_Typ table.
COMP_DATE	R	Completion Date. This is the date on which the assigned mapping partner completed the work.
TASK_TYP	R	Data Development Task Type. This is the type of data development task represented by the polygonal footprint of that task. Acceptable values for this field are listed in the D_Task_Typ table.
HYDRO_MDL	A	Hydrologic Model. This is the name or abbreviation of the hydrologic model that was used for the engineering analysis. Where applicable, the version and year of the model must be specified. This field is required when a hydrologic model was utilized in the flood risk project area.
HYDRA_MDL	A	Hydraulic Model. This is the name or abbreviation of the hydraulic model that was used for the engineering analysis. Where applicable, the version and year of the model must be specified. This field is required when a hydraulic model was utilized in the flood risk project area.
CST_MDL_ID	A	Coastal Model. This is the foreign key to the L_Cst_Model table. The L_Cst_Model table contains information about the specific coastal models utilized in the flood risk project area. This field is required when the data development task type is COASTAL or FLOODPLAIN MAPPING and when a coastal model was utilized for this update.
TOPO_SRC	A	Source of the topographic data used in this specific submittal. This value is used to populate the FIS report Floodplain Mapping Methodology table.
TOPO_SCALE	A	The scale of the topographic data used in this specific submittal. This references the scale of the topographic map and is stored as the scale ratio denominator (i.e. 2400, for 1:2400 or 1"=200').
CONT_INTVL	A	Contour interval of the topographic data used in this specific submittal. This provides the difference in surface values between contours.
EFF_DATE	R	Submittal Effective Date.
CONTRACT_NO	R	Contract Number.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. This field links the S_Submittal_Info record to the bibliography information located in L_Source_Cit. The abbreviation must match a value in L_Source_Cit.



Table: S\_Submittal\_Info [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
SUBINFO_ID	R	Text	25		N/A
CASE_NO	R	Text	12		N/A
CASE_DESC	R	Text	254		N/A
SUBMIT_BY	R	Text	100		N/A
HUC8	A	Text	8		N/A
STUDY_TYP	R	Text	100		D_STUDY_TYP
COMP_DATE	R	Date	8	0	N/A
TASK_TYP	R	Text	25		D_TASK_TYP
HYDRO_MDL	A	Text	100		N/A
HYDRA_MDL	A	Text	40		N/A
CST_MDL_ID	A	Text	25		L_CST_MODEL
TOPO_SRC	A	Text	50		N/A
TOPO_SCALE	A	Long Integer	Default		N/A
CONT_INTVL	A	Double	Default		N/A
EFF_DATE	R	Date	Default	0	N/A
CONTRACT_NO	R	Text	50		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.29 Table: S\_Trnsport\_Ln****[October 2011]**

This table is required for all FIRM Databases that use a vector rather than raster base map data, but should be populated for all studies where MAF/TIGER data are available.

The S\_Trnsport\_Ln table contains information about the linear base map transportation features such as roads and railroads. A spatial file with location information also corresponds with this data table.

The default source for transportation features is U.S. Census Bureau MAF/TIGER transportation data. If MAF/TIGER data are not available or the use of MAF/TIGER is not feasible, transportation data from a different source may be used at the discretion of the FEMA Project Officer, provided that they meet the FEMA base map standard. Any exceptions to these guidelines should be documented in the metadata. If a community wants to use its own data, the features must be provided in the data structure specified in the table below. The community-supplied transportation features must reference the correct MTFCC code as referenced in the D\_MTFCC domain table. This information is used in the FIRM Panel Index Map and on the Transect Locator Map in the FIS report.

The spatial entities representing linear transportation features are normally lines.

The S\_Trnsport\_Ln table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
TRANS_ID	R	Primary key for table lookup. Assigned by table creator.
MTFCC	R	MAF/TIGER feature class code. Defines of the primary feature type for the transportation feature, as defined the D_MTFCC domain table. Examples include Primary Road (S1100), Secondary Route (S1200), etc.
FULLNAME	R	Full name of feature. Concatenation of expanded text for prefix, qualifier, prefix direction, prefix type, base map name, suffix type, suffix direction, and suffix qualifier (as available) with a space between each expanded text field. For areas with more than one name, this would be the primary name with subsequent names shown in fields below. Non-standard names like "Intracoastal Waterway" would also be included in this item.
ALTNAME1	A	First alternative name of feature. This is the secondary name of the feature.
ALTNAME2	A	Second alternative name of feature. This is the tertiary name of the feature.
ROUTENUM	A	Route Number. This is where route numbers are stored for placing route shields on the FIRMs. Determined from MAF/TIGER FULLNAME field.
ROUTE_TYP	R	Route Type. This is the route type used for placing route shields on the FIRM panel. Acceptable values for this field are listed in the D_Route_Typ table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

Table: S\_Trnsport\_Ln [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
TRANS_ID	R	Text	25		N/A
MTFCC	R	Text	25		D_MTFCC
FULLNAME	R	Text	100		N/A
ALTNAME1	A	Text	100		N/A
ALTNAME2	A	Text	100		N/A
ROUTENUM	A	Text	6		N/A
ROUTE_TYP	R	Text	11		D_ROUTE_TYP
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.30 Table: S\_Tsct\_Basln****[October 2011]**

The S\_Tsct\_Basln layer is required for all coastal studies. The S\_Tsct\_Basln spatial file contains information about the transect baseline used in the coastal flood hazard model. Typically, the S\_Tsct\_Basln represents the 0.0-foot elevation contour, the starting point for the transect, and the measuring point for the coastal mapping. The spatial elements representing the transect baselines are lines. The file describes the transect baseline profile setting and must also include a reference to the vertical datum. This information is used in the following tables in the FIS report: Transect Locator Map, as well as in the Flooding Sources Included this FIS Report, Summary of Coastal Analyses, Summary of Topographic Elevation Data Used in Mapping, and Coastal Transect Parameters.

The spatial entities representing the transect baselines are lines.

The S\_Tsct\_Basln table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
TBASELN_ID	R	Primary key for table lookup. Assigned by table creator.
CST_MDL_ID	A	Coastal Model Identification. This field is the foreign key to the L_Cst_Model table. Multiple transects may link to a single record in the L_Cst_Model table. This field is populated for new coastal studies. This field is also populated for coastal redelineations and digital conversions when the data are available.
TBASE_TYP	R	Transect Baseline Type. This is the type of source data for the transect baseline. This value describes the criteria used in determining the transect baseline in coastal flood hazard models. Acceptable values for this field are listed in the D_TsctBasln_Typ table.
R_ST_DESC	R	Reach Name Start Description. This describes the location of the start of the flood risk project reach.
R_END_DESC	R	Reach Name End Description. This describes the location of the end of the flood risk project reach.
V_DATUM	R	Vertical Datum. The vertical datum indicates the reference surface from which the 0.0-foot contour is measured. Normally, this would be NAVD88. Acceptable values for this field are listed in the D_V_Datum table.
WTR_NM	R	Surface Water Feature Name. This is the formal name of the coastal water feature as it will appear on the hardcopy FIRM.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

Table: S\_Tsct\_Basln [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
TBASELN_ID	R	Text	25		S_CST_TSCT_LN
CST_MDL_ID	A	Text	25		L_CST_MODEL
TBASE_TYP	R	Text	50		D_TSCTBASLN_TYP
R_ST_DESC	R	Text	254		N/A
R_END_DESC	R	Text	254		N/A
V_DATUM	R	Text	17		D_V_DATUM
WTR_NM	R	Text	100		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.31 Table: S\_Wtr\_Ar****[October 2011]**

This table is required for any FIRM Database where vector surface water features are shown on the FIRM and some of these features are represented as polygons in the spatial data. Otherwise, the table is optional.

The S\_Wtr\_Ar table contains information about surface water area features. A spatial file with location information also corresponds with this data table.

The spatial elements representing surface water area features are polygons. Normally lakes, ponds and other wide bodies of water will be represented as polygons. The main purpose of the S\_Wtr\_Ar table is to provide a cartographic depiction of the areal surface water features for visual interpretation of the mapping data. As a result, the method for structuring surface water features as polygons is very flexible. This information is used in the Transect Locator Map and the FIRM Panel Index in the FIS report, as well as the FIRM panels.

The S\_Wtr\_Ar table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
WTR_AR_ID	R	Primary key for table lookup. Assigned by table creator.
WATER_TYP	R	Surface Water Feature Type. This type value describes the classification of the surface water feature. Valid entries include items such as OPEN WATER AREA, WETLANDS, and MANMADE WATER FEATURE. Profile baselines must be stored in the S_Profil_Basln layer. Acceptable values for this field are listed in the D_Water_Typ table.
WTR_NM	R	Surface Water Feature Name. This is the formal name of the surface water feature, as it will appear on the hardcopy FIRM. This field is populated when the water feature name is known and shown on the FIRM. Unnamed bodies of water follow the convention shown in Section L.4.6.12 related to null text values.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_Wtr\_Ar [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
WTR_AR_ID	R	Text	25		N/A
WATER_TYP	R	Text	25		D_WATER_TYP
WTR_NM	R	Text	100		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.32 Table: S\_Wtr\_Ln****[October 2011]**

This table is required for any FIRM Database where vector surface water features are shown on the FIRM and some of these features are represented as lines in the spatial data. Vector streams must always be shown with a vector base map. They may also be shown on raster base maps at the discretion of the FEMA Project Officer.

The S\_Wtr\_Ln table contains information about surface water linear features. A spatial file with location information also corresponds with this data table.

The spatial elements representing surface water line features are lines. Normally stream centerlines will be represented as line features. However, the main purpose of the S\_Wtr\_Ar table and the S\_Wtr\_Ln table is to provide a cartographic depiction of the surface water features for visual interpretation of the mapping data. As a result, the method for structuring surface water features as lines or polygons is very flexible. Lake shorelines and stream channel banks used to show lakes and wide rivers may be represented as polygons. However, they may be represented as lines based on the structure of the data received and the mapping partner's discretion. Surface water features may appear in either the S\_Wtr\_Ar table or the S\_Wtr\_Ln table or both. However, features that appear in both must match exactly. The hydrologic structure of the modeled stream network will be represented by the S\_Profil\_Basln layer.

This information is used in the Transect Locator Map and the FIRM Panel Index in the FIS report, as well as the FIRM panels.

The S\_Wtr\_Ln table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
WTR_LN_ID	R	Primary key for table lookup. Assigned by table creator.
WATER_TYP	R	Surface Water Feature Type. The type value describes the kind of watercourse represented. Valid entries include items such as STREAM CENTERLINE, OPEN WATER AREA, WETLANDS, and MANMADE WATER FEATURE. Acceptable values for this field are listed in the D_Water_Typ table.
WTR_NM	R	Surface Water Feature Name. This is the formal name of the surface water feature, as it will appear on the hardcopy FIRM.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.



Table: S\_Wtr\_Ln [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
WTR_LN_ID	R	Text	25		N/A
WATER_TYP	R	Text	25		D_WATER_TYP
WTR_NM	R	Text	100		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.33 Table: S\_XS****[October 2011]**

This table is required for any FIRM Database where cross sections are shown on the FIRM or where modeled cross sections were used to generate the special flood hazard area boundaries. Normally, any FIRM that has associated flood profiles has cross sections.

The S\_XS table contains information about cross section lines. These lines represent the locations of channel surveys performed for input into the hydraulic model used to calculate flood elevations. Depending on the zone designation (Zone AE, Zone A, etc.), these locations may be shown on Flood Profiles in the FIS report and can be used to cross reference the Flood Profiles to the planimetric depiction of the flood hazards. All cross sections used in the development of effective hydraulic models shall be stored in this table, regardless of the flood hazard zone depicted on the effective panels. This information is used in the Floodway Data Tables in the FIS report, as well as on the FIRM panels.

Cross sections shall be selected from the hydraulic model output so that there is at least one mapped cross section for every 1-foot vertical rise in the 1—percent-annual-chance elevation. If there are not enough modeled cross sections to meet the maximum 1-foot vertical rise rule mentioned above, BFE lines must be placed in the S\_BFE feature class for the area where cross section maximum vertical rise requirements are not met. Detailed procedures on BFE line placement can be found in Section L.8.3: S\_BFE.

In cases where more cross sections exist in the hydraulic model than can be shown on a FIRM at map scale, the mapping partner must use engineering judgment to select the appropriate cross sections to avoid overcrowding the FIRM panel. In addition, the mapping partner must consult the FEMA Project Officer and follow the guidelines in *Volume 1* of the *Guidelines and Standards*.

All cross sections – modeled or interpolated – must be stored in the S\_XS, regardless of whether or not they are shown on the FIRM.

The spatial entities representing cross sections are lines.

The S\_XS layer contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter “C” (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
XS_LN_ID	R	Primary key for table lookup. Assigned by table creator.
WTR_NM	R	Surface Water Feature Name. This is the name of the stream or water body.
STREAM_STN	R	Stream Station. This is the measurement along the profile baseline to the cross section location. This value is used in the FDTs and profiles.
START_ID	R	Station Start Identification. This is the foreign key to the S_Stn_Start layer. The station start describes the origin for the measurements in the STREAM_STN field. This value is used in the FDTs and profiles.

XS_LTR	A	Cross Section Letter. This is the letter or number that is assigned to the cross section on the hardcopy FIRM and in the FIS report. This field is populated when the cross section is lettered.
XS_LN_TYP	R	Cross-Section Line Type. This attribute should contain 'LETTERED, MAPPED' for cross sections that are shown on the hardcopy FIRM and are given a letter. If the cross section will be shown on the FIRM but not lettered, the attribute should contain 'NOT LETTERED, MAPPED' to indicate that it is a cross section placed to meet the 1-foot vertical rise rule mentioned above. If the cross section will not be shown on the hardcopy FIRM, this attribute should contain 'NOT LETTERED, NOT MAPPED' to indicate that the cross section is part of the backup data for the flood risk project, but is not shown on the FIRM. All cross sections used in the development of effective hydraulic models shall be stored in this table, regardless of the flood hazard zone depicted on the effective panels. Acceptable values for this field are listed in the D_XS_LN_TYP table.
WSEL_REG	R	Modeled Water Surface Elevation for the 1-Percent-Annual-Chance Flood Event. This the modeled water-surface elevation for the 1-percent-annual-chance flood event in the stream channel at this cross section. In the case of levee(s) associated with a cross section, it is assumed that the levee(s) holds. This field is stored here and in L_XS_Elev to simplify annotation of the FIRM panel water-surface elevation at this cross section. This value and the corresponding value in L_XS_Elev must match.
STRMBED_EL	R	Streambed Elevation. This is the water-surface elevation for the thalweg or the lowest point in the main channel. This value is used in the profiles.
LEN_UNIT	R	Water-Surface and Streambed Elevation Units. This unit indicates the measurement system used for the water-surface and streambed elevations. Normally, this would be feet. Acceptable values for this field are listed in the D_Length_Units table.
V_DATUM	R	Vertical Datum. The vertical datum indicates the reference surface from which the flood and streambed elevations are measured. Normally, this would be NAVD88. Acceptable values for this field are listed in the D_V_Datum table.
PROFXS_TXT	A	Profile Cross Section Text. This field stores user-defined cross section text that is plotted on the profile. This field is only required to be populated if and when the data can be exported from RASPLLOT in Appendix L format.
MODEL_ID	R	Model Identifier. This field stores the feature's identifier that was used during hydrologic and hydraulic modeling. This field provides a link between the hydrologic or hydraulic modeling and this spatial file.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

Table: S\_XS [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
XS_LN_ID	R	Text	25		L_XS_ELEV L_XS_STRUCT
WTR_NM	R	Text	100		N/A
STREAM_STN	R	Double	Default		N/A
START_ID	R	Text	25		S_STN_START
XS_LTR	A	Text	12		N/A
XS_LN_TYP	R	Text	24		D_XS_LN_TYP
WSEL_REG	R	Double	Default		N/A
STRMBED_EL	R	Double	Default		N/A
LEN_UNIT	R	Text	11		D_LENGTH_UNITS
V_DATUM	R	Text	17		D_V_DATUM
PROFXS_TXT	A	Text	80		N/A
MODEL_ID	R	Text	100		N/A
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.34 Table: S\_Zone\_AR****[October 2011]**

The S\_Zone\_AR layer contains information about the areas defined as Zone AR within the flood risk project area. In some cases, a flood-control system that previously protected an area from the 1-percent-annual-chance flood event is subsequently decertified. Zone AR indicates that the flood-control system is being restored to provide protection from the 1-percent-annual-chance flood event. This layer is required when the flood risk project area contains flood hazards defined as Zone AR. Alternate zone(s) will be shown in S\_FLD\_HAZ\_AR for the area covered by this polygon.

The spatial entities representing Zone AR flood hazards are polygons.

The S\_Zone\_AR layer contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
ZONE_AR_ID	R	Primary key for table lookup. Assigned by table creator.
AR_BFE	A	Zone AR Static Base Flood Elevation. This field will be populated for Zone AR areas that have been determined to have a constant BFE. In this situation, the same BFE applies to the entire polygon. This normally occurs in lakes and coastal zones.
V_DATUM	A	Vertical Datum. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally, this would be NAVD88 for new studies. This field is only populated when the AR_BFE field is populated. Acceptable values for this field are listed in the D_V_Datum table.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the feature. The abbreviation must match a value in L_Source_Cit.

**Table: S\_Zone\_AR [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
ZONE_AR_ID	R	Text	25		N/A
AR_BFE	A	Double	Default	2	N/A
V_DATUM	A	Text	17		D_V_DATUM
SOURCE_CIT	R	Text	11		L_SOURCE_CIT

**L.8.35 Table: Study\_Info****[October 2011]**

This table is required for all Preliminary and Final FIRM Databases.

The Study\_Info table contains details about the flood risk project such as the project name, datum, and projection. There is normally only one record in this table for each flood risk project. This information is used on the FIS report cover, the FIRM Panel Index, and the FIRM Notes to Users table in the FIS report.

The Study\_Info table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
STD_NFO_ID	R	Primary key for table lookup. Assigned by table creator.
STUDY_PRE	A	Study Prefix. This is the prefix of the flood risk project name such as 'City of' or 'Town of.' This field is applicable for single-jurisdiction maps where the type of jurisdiction precedes the name of the jurisdiction in the map title. For countywide maps or maps of the unincorporated portions of a county, this field is null. Acceptable values for this field are listed in the D_Study_Prefix table.
STUDY_NM	R	Study Name. This attribute contains the main portion of the flood risk project name, which is shown in the title block of the hardcopy FIRM. For countywide FIRMs, or FIRMs for the unincorporated portions of counties, the name should include the county or county equivalent descriptor (e.g. Washington County or Iberia Parish).
STATE_NM	R	State Name. This attribute contains the State name for the flood risk project and is shown in the title block of the hardcopy FIRM.
CNTY_NM	R	County Name. This is the name of the county (or county equivalent) in which the flood risk project falls. The name should include the county or county equivalent descriptor (e.g. Washington County or Iberia Parish). The county name is also shown in the title block section of the hardcopy FIRM.
JURIS_TYP	A	Political Jurisdiction Type. This field is populated when the political entity has an associated jurisdiction type. If there are data in this attribute, it is also shown in the title block section of the hardcopy FIRM. Acceptable values for this field are listed in the D_Jurisdiction_Typ table.
LG_PAN_NO	R	Largest Panel Number. This is the highest panel number shown on the FIRM Index for the area mapped. This number is shown in the title block section of the hardcopy FIRM.
OPP_TF	R	Only Panel Printed. This field is true when the flood risk project has only one printed panel. Acceptable values for this field are listed in the D_TrueFalse table.

H_DATUM	R	Horizontal Datum. Valid entries for this attribute include North American Datum of 1927 (NAD27) or North American Datum of 1983 (NAD83). This is the horizontal datum used for the printed FIRM. The horizontal datum describes the reference system on which the horizontal coordinate information shown on the FIRM is based. NAD83 is the preferred horizontal datum. Acceptable values for this field are listed in the D_Horiz_Datum table.
V_DATUM	R	Vertical Datum. This is the vertical datum of the printed FIRM. The vertical datum describes the reference surface from which elevation on the map is measured. Normally, this would be North American Vertical Datum of 1988 for new studies. Acceptable values for this field are listed in the D_V_Datum table.
PROJECTION	R	Map Projection used for hardcopy FIRM publication. The preferred projection is Universal Transverse Mercator (UTM). If a State Plane coordinate system and associated projection is used, this field should include the name of the projection, the State and the zone (e.g., Virginia North Zone). Acceptable values for this field are listed in the D_Projection table.
PROJ_ZONE	A	Projection Zone. When using many map projections and coordinate systems, there is a zone associated with the area. This field is populated based on the projection selected for the Final hardcopy map production. This applies if the projection used has a zone parameter such as UTM or State plane. The zone should be stated as the appropriate Federal Information Processing Standard zone or FIPSZONE.
PROJ_UNIT	R	Projection Unit. When using map projections and coordinate systems, there is a unit associated with the projection defined in the PROJECTION field. This field is populated based on the projection selected for the Final hardcopy map production. Acceptable values for this field are listed in the D_Proj_Unit table.
PROJ_SECND	A	Secondary Projection. A UTM projection is required as a reference grid for every flood risk project. If the PROJECTION field value is a State Plane projection, this field must be populated with a UTM projection. If the PROJECTION field value is the UTM projection, this field may be populated at the discretion of the mapping partner. Acceptable values for this field are listed in the D_Projection table.
PROJ_SUNIT	A	Secondary Projection Unit. When using map projections and coordinate systems, there is a unit associated with the projection. This field is populated based on the projection selected for the PROJ_SECND field. If the PROJ_SECND field value is Null, this field should also be Null. Acceptable values for this field are listed in the D_Proj_Unit table.
LANDWD_VAL	R	Landward value of Coastal Base Flood Elevations shown on the FIRM Notes to Users figure in the FIS report. This is usually but not always 0.0 feet, and the FIS Report would state "Coastal Base Flood Elevations shown on the map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88)."
CW_TF	R	Countywide Flood Risk Project. This attribute is true if the flood risk project includes all incorporated areas and any unincorporated areas of the county. Acceptable values for this field are listed in the D_TrueFalse table.

RTROFT_TF	R	Retrofit, True/False. The Retrofit attribute should be true if older flood risk project data are used with updated stream location data. If flood features were adjusted to fit new stream locations due to better base map information this attribute would be true. Acceptable values for this field are listed in the D_TrueFalse table.
META_NM	R	Metadata File Name. This attribute stores the name of the metadata file. The file should be provided in either TXT or XML formats and named <ST_FIPS><PCOMM>_<EFF_DATE>_metadata.txt (or .xml); where ST_FIPS is the two digit State FIPS code; PCOMM is the four digit community or county identification number; and EFF_DATE is the effective date of the flood risk project. If the flood risk project is not yet effective, the effective date, <EFF_DATE>, should be replaced with the word "PRELIM."
FIS_NM	R	FIS report text File Name. This attribute stores the name of the FIS report text file. If there are multiple FIS report volumes, enter the first volume. The file should be named <FIPS><VolumeNumber>.PDF; where <VolumeNumber> has four digits: V000 for the first FIS report volume .
LOGO_NM	R	Logo File Name. This attribute stores the file name of the logo used on the map panels, either the DHS or the FEMA logo.
INDX_EFFDT	R	Index Effective Date. This attribute stores the current effective date of the Index.
DBVRS_DT	R	FIRM Database last updated date. This date is the most recent date that the Database was updated to incorporate new information such as LOMRs or a PMR.



Table: Study\_Info [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
STD_NFO_ID	R	Text	25		N/A
STUDY_PRE	A	Text	20		D_STUDY_PREFIX
STUDY_NM	R	Text	128		N/A
STATE_NM	R	Text	24		D_STATE_NAME
CNTY_NM	R	Text	128		N/A
JURIS_TYP	A	Text	22		D_JURISDICTION_TYP
LG_PAN_NO	R	Text	4		N/A
OPP_TF	R	Text	1		D_TRUEFALSE
H_DATUM	R	Text	10		D_HORIZ_DATUM
V_DATUM	R	Text	17		D_V_DATUM
PROJECTION	R	Text	128		D_PROJECTION
PROJ_ZONE	A	Text	4		N/A
PROJ_UNIT	R	Text	25		D_PROJ_UNIT
PROJ_SECND	A	Text	75		D_PROJECTION
PROJ_SUNIT	A	Text	25		D_PROJ_UNIT
LANDWD_VAL	R	Double	Default		N/A
CW_TF	R	Text	1		D_TRUEFALSE
RTROFT_TF	R	Text	1		D_TRUEFALSE
META_NM	R	Text	50		N/A
FIS_NM	R	Text	14		N/A
LOGO_NM	R	Text	50		N/A
INDX_EFFDT	R	Date	Default	0	N/A
DBVRS_DT	R	Date	Default	0	N/A

**L.8.36 Table: L\_Comm\_Info****[October 2011]**

This table is required for all Preliminary or Final FIRM Databases.

The L\_Comm\_Info table is a lookup table that contains community map repository details and map history information that is shown in the Listing of NFIP Jurisdictions, Map Repositories, and Community Meetings tables in the FIS report. This table will include any community that has a CID; even if it is considered non-floodprone or non-participating. Communities that do not have a CID issued by FEMA, or are not included within the area of the data submittal, will not appear in this table. The “not populated” values that are described in Section L.4.6.12 may be used to fill in some of the required fields when necessary. There is normally one record in this table for each community mapped on the FIRM.

The L\_Comm\_Info table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter “C” (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
COM_NFO_ID	R	Primary key for table lookup. Values in this field must match the values in the COM_NFO_ID field of the S_Pol_Ar table.
REPOS_ADR1	R	Repository Street Address 1. First line of the mailing or street address for the map repository. The map repository is the office the community has designated as responsible for maintaining copies of all the flood hazard information FEMA publishes for the community. The public may view copies of the current effective information at the map repository. For example, this line might read ‘Division of Community and Economic Development.’
REPOS_ADR2	A	Repository Street Address 2. Second line of the mailing or street address for the map repository. For example, this line might read ‘226 W. Fourth Street.’ This field is applicable if the map repository address requires more than one line.
REPOS_ADR3	A	Repository Street Address 3. Third line of the mailing or street address for the map repository. For example, this line might read ‘Suite 200.’ This field is applicable if address requires additional space.
REPOS_CITY	R	Repository City. City portion of the mailing or street address for the map repository. For example, this line might read ‘Springfield.’
REPOS_ST	R	Repository State. State portion of the mailing or street address for the map repository. The full name of the State should be provided. For example, this line might read ‘ILLINOIS.’ This field is used to populate the FIS Report Map Repositories table. Acceptable values for this field are listed in the D_State_Name table.
REPOS_ZIP	R	Repository Zip code. ZIP code portion of the mailing or street address for the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read ‘62269.’ This field is used to populate the FIS Report Map Repositories table.

IN_ID_DAT	R	Initial Identification Date. This is the initial identification date for the community as shown on the FIRM legend, index, or FIS report. This information can also be obtained from FEMA. See <i>Appendix J</i> of these Guidelines and <i>Procedure Memorandum No. 66</i> for more detailed information about map dates.
IN_NFIP_DT	R	Initial NFIP Date. This is the initial date of the first NFIP map published by FEMA for this community. This can be obtained from the FIRM legend, index, or FIS report. This information can also be obtained from FEMA. See <i>Appendix J</i> of these Guidelines and <i>Procedure Memorandum No. 66</i> for more detailed information about map dates.
IN_FHBM_DT	R	Initial FHBM Date. This is the initial date of first Flood Hazard Boundary Map published for this community.
IN_FRM_DAT	R	Initial FIRM Date. This is the date of the initial FIRM created for this community. This can be obtained from the FIRM legend, index, or FIS report. This information can also be obtained from FEMA. See <i>Appendix J</i> of these Guidelines and <i>Procedure Memorandum No. 66</i> for more detailed information about map dates.
FST_CW_EFF	R	Initial Countywide Effective Date. This is the effective date of the first countywide FIRM for this community. This date will be displayed on the FIRM panel under the heading EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP.
FST_CW_FIS	R	Initial Countywide Effective Flood Insurance Study Date. This is the effective date of the first countywide FIS for this community. This date will generally be the same as the first countywide FIRM for this community, except where an FIS was not published with the first countywide FIRM.
RECENT_DAT	A	Most Recent Panel Date. This can be obtained from the FIRM Index or the FEMA Community Status book at <a href="http://www.msc.fema.gov">www.msc.fema.gov</a> . This field is only populated for Final FIRM Databases. See <i>Appendix J</i> of these Guidelines and <i>Procedure Memorandum No. 66</i> for more detailed information about map dates.
REVISIONS	R	Revisions. This indicates whether the community has had map revisions. If there are map revisions for this community, enter true. Acceptable values for this field are listed in the D_TrueFalse table.
MULTICO_TF	R	Multi-county community. This attribute would be True if the community is in more than one county. Acceptable values for this field are listed in the D_TrueFalse table.
FLOODPRONE	R	Floodprone. This attribute stores information about the floodprone status of the community. Enter True if the community is floodprone. Acceptable values for this field are listed in the D_TrueFalse table.
FIS_INCLUD	R	Community Included in this FIS. This value indicates whether the community is included in this FIS report. If the FIS is included, this field is True. Acceptable values for this field are listed in the D_TrueFalse table.
RECENT_FIS	R	FIS Report Effective Date. This is the effective date of the current FIS report.

**Table: L\_Comm\_Info [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
COM_NFO_ID	R	Text	25		S_POL_AR L_COMM_REVIS
REPOS_ADR1	R	Text	50		N/A
REPOS_ADR2	A	Text	50		N/A
REPOS_ADR3	A	Text	50		N/A
REPOS_CITY	R	Text	50		N/A
REPOS_ST	R	Text	50		D_STATE_NAME
REPOS_ZIP	R	Text	10		N/A
IN_ID_DAT	R	Date	Default	0	N/A
IN_NFIP_DT	R	Date	Default	0	N/A
IN_FHBM_DT	R	Date	Default	0	N/A
IN_FRM_DAT	R	Date	Default	0	N/A
FST_CW_EFF	R	Date	Default	0	N/A
FST_CW_FIS	R	Date	Default	0	N/A
RECENT_DAT	A	Date	Default	0	N/A
REVISIONS	R	Text	1		D_TRUEFALSE
MULTICO_TF	R	Text	1		D_TRUEFALSE
FLOODPRONE	R	Text	1		D_TRUEFALSE
FIS_INCLUD	R	Text	1		D_TRUEFALSE
RECENT_FIS	R	Date	Default	0	N/A

**L.8.37 Table: L\_Comm\_Revis****[October 2011]**

The L\_Comm\_Revis table is completed to capture revision dates per community. It is used to populate the FIRM revision dates column in the Community Map History table in the FIS report text. There can be multiple FIRM revision dates for each community listed in L\_Comm\_Info.

The L\_Comm\_Revis table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit state FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to which it was created.
COM_REV_ID	R	Primary key for table lookup. Assigned by table creator.
COM_NFO_ID	R	Foreign Key to L_Comm_Info. There can be multiple records for each community listed in L_Comm_Info.
REVIS_DATE	R	Revision Date. Effective date of revision to the FIRM panel. FIRM revision dates can be found in the FIRM legend or the FIS report.

**Table: L\_Comm\_Revis [October 2011]**

Field	R/A/O R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
COM_REV_ID	R	Text	25		N/A
COM_NFO_ID	R	Text	25		L_COMM_INFO
REVIS_DATE	R	Date	Default	0	N/A

**L.8.38 Table: L\_Cst\_Model****[October 2011]**

The L\_Cst\_Model table is completed if a coastal engineering analysis was performed. It is required for new coastal studies. For coastal redelineations and digital conversions, the table may be populated if the information is available. The L\_Cst\_Model table is a lookup table that contains information about the coastal models used during the engineering analysis. If a different set of models is used for different reaches of the flood risk project area, a unique row must be populated for each set. It is used in the following tables in the FIS report: Summary of Coastal Analyses, Tide Gage Analysis Specifics, and Coastal Transect Parameters.

The L\_Cst\_Model table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
CST_MDL_ID	R	Primary key for table lookup. Assigned by table creator.
HUC8	R	HUC8 Code. This is the unique eight-digit hydrologic unit code based on USGS levels of classification in the hydrologic unit system.
STUDY_TYP	R	Study Type. This describes the type of flood risk project performed for flood hazard identification. Acceptable values for this field are listed in the D_Study_Typ table.
WTR_NM	R	Surface Water Feature Name. This is the formal name of the surface water feature.
LIMIT_FROM	R	Study Limit From. This is the study limit "from" value (e.g., "From the North Carolina/City of Virginia Beach boundary.")
LIMIT_TO	R	Study Limit To. This is the study limit "to" value (e.g., "To the northernmost boundary of Fort Story at 96 <sup>th</sup> Street".)
SURGE_MDL	A	Storm Surge Model. This is the name or abbreviation of the FEMA-approved storm surge model associated with the coastal engineering analysis. Acceptable values for this field are listed in the D_Surge_Mdl table. This field is populated when new surge calculations are conducted as part of the new coastal flood risk project. This field is also populated for a coastal redelineation or digital conversion when surge model data are available from a previous flood risk project.
SURGE_DATE	A	Storm Surge Model Run Date. This is the date of the last model run included in the analysis. This field is populated when new surge calculations are conducted as part of the coastal flood risk project. This field is also populated for a coastal redelineation or digital conversion when surge model data are available from a previous flood risk project.
SURGE_EFF	A	Surge Effective Date. Effective date of the surge model. This field is populated for a coastal redelineation or digital conversion when previously effective surge model data were used. This field is not populated for new coastal analysis.

STRM_PRM	A	Storm Parameterization Method. This is the name or abbreviation of the storm parameterization method used for storm surge simulations. This field is populated when storm parameterization is included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when storm surge modeling data are available from a previous flood risk project.
STM_PRM_DT	A	Storm Parameterization Date. This is the date the storm parameterization was completed. This field is populated when the storm parameterization is included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when the storm parameterization data are available from a previous flood risk project.
TDESTAT_MT	A	Tide Gage Analysis Method. This is the name or abbreviation of the flood frequency analysis method and distribution used for tide gage analysis. This field is populated when tide gage analysis is included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when tide gage analysis data are available from a previous flood risk project.
TDESTAT_DT	A	Tide Gage Analysis Date. This is the date the tide gage analysis was completed. This field is populated when the tide gage analysis is included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when the tide gage analysis data are available from a previous flood risk project.
WAVEHT_MDL	A	Wave Height Model. This is the name or abbreviation of the FEMA-approved wave height model that was used for the coastal engineering analysis. Acceptable values for this field are listed in the D_Wave_Mdl table. This field is populated when wave calculations are included in the scope of the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when wave height model data are available from a previous flood risk project.
WAVEHT_DT	A	Wave Height Model Run Date. This is the date the model was run. This field is populated when wave calculations are included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when wave height model data are available from a previous flood risk project.
RUNUP_MDL	A	Runup Model. This is the name or abbreviation of the FEMA-approved wave runup model that was used for the coastal engineering analysis. Acceptable values for this field are listed in the D_Runup_Mdl table. This field is populated when runup calculations are included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when runup model data are available from a previous flood risk project.
RUNUP_DATE	A	Runup Model Run Date. This is the date the wave runup model was run. This field is populated when runup calculations are included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when runup model data are available from a previous flood risk project.



SETUP_METH	A	Wave Setup Methodology. This information should detail the methodology used for determining the wave setup magnitude. This field is populated when wave setup is included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when wave setup methodology is available from a previous flood risk project.
SETUP_DATE	A	Wave Setup Methodology Date. This is the date the setup methodology was run. This field is populated when wave setup is included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when wave setup methodology is available from a previous flood risk project.
R_FETCH_MT	A	Restricted Fetch Wave Growth Methodology. This information should detail the methodology used for calculating restricted fetch wave growth. This field is populated when restricted fetch wave growth is included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when restricted fetch wave growth analysis is available from a previous flood risk project.
R_FETCH_DT	A	Restricted Fetch Wave Growth Methodology Date. This is the date the restricted fetch wave growth modeling was run. This field is populated when restricted fetch wave growth analysis is included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when restricted fetch wave growth analysis is available from a previous flood risk project.
EROS_METH	A	Dune or Bluff Erosion Methodology. This information should detail the methodology used for determining the eroded profile geometry. Acceptable values for this field are listed in the D_Erosion table. This field is populated when erosion is included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when erosion methodology is available from a previous flood risk project.
EROS_DATE	A	Erosion Analysis Date. This is the date the erosion analysis was completed. This field is populated when erosion is included in the new coastal analysis. This field is also populated for a coastal redelineation or digital conversion when erosion analysis is available from a previous flood risk project.
EROS_TF	R	Erosion Treatment. Has erosion treatment been applied in the coastal modeling? This field is populated when erosion is included in the new coastal analysis. Acceptable values for this field are listed in the D_TrueFalse table.
PFD_TF	R	Primary Frontal Dune. Have primary frontal dune criteria been applied in the coastal modeling? This field is populated when a primary frontal dune is included in the new coastal analysis. Acceptable values for this field are listed in the D_TrueFalse table.
WAVE_EFFDT	A	Wave Effective Date. Effective date of the wave height and wave runup models. This field is populated for a coastal redelineation or digital conversion when previously effective wave analysis data were used. This field is not populated for new coastal analysis.
HAZARDEVAL	R	Coastal hazard type evaluated. Examples include Storm Surge, Storm Parameterization, Wave Runup, Wave Generation, and Overland Wave Propagation.



Table: L\_Cst\_Model [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
CST_MDL_ID	R	Text	25		S_CST_TSCT_LN S_CST_GAGE S_SUBMITTAL_INFO S_TSCT_BASLN
HUC8	R	Text	8		N/A
STUDY_TYP	R	Text	100		D_STUDY_TYP
WTR_NM	R	Text	100		N/A
LIMIT_FROM	R	Text	100		N/A
LIMIT_TO	R	Text	100		N/A
SURGE_MDL	A	Text	37		D_SURGE_MDL
SURGE_DATE	A	Date	Default	0	N/A
SURGE_EFF	A	Date	Default	0	N/A
STRM_PRM	A	Text	50		N/A
STM_PRM_DT	A	Date	Default	0	N/A
TDESTAT_MT	A	Text	50		N/A
TDESTAT_DT	A	Date	Default	0	N/A
WAVEHT_MDL	A	Text	23		D_WAVE_MDL
WAVEHT_DT	A	Date	Default	0	N/A
RUNUP_MDL	A	Text	24		D_RUNUP_MDL
RUNUP_DATE	A	Date	Default	0	N/A
SETUP_METH	A	Text	50		N/A
SETUP_DATE	A	Date	Default	0	N/A
R_FETCH_MT	A	Text	50		N/A
R_FETCH_DT	A	Date	Default	0	N/A
EROS_METH	A	Text	12		D_EROSION
EROS_DATE	A	Date	Default	0	N/A
EROS_TF	R	Text	1		D_TRUEFALSE
PFD_TF	R	Text	1		D_TRUEFALSE
WAVE_EFFDT	A	Date	Default	0	N/A
HAZARDEVAL	R	Text	25		N/A

**L.8.39 Table: L\_Cst\_Struct****[October 2011]**

The L\_Cst\_Struct table is required whenever coastal structures, such as breakwaters, levees, or seawalls, affect local topography and flood hazards. The L\_Cst\_Struct table contains information about the coastal structures within the flood risk project area.

The L\_Cst\_Struct table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
CST_STR_ID	R	Primary key for table lookup. Assigned by table creator.
STRUCT_ID	R	Foreign Key to S_Gen_Struct.
CERT_DOC	A	Certification Document. <Filename.zip> of the structure certification documentation. This field is populated when the coastal structure has been certified by a professional engineer or Federal agency to remain intact during a 1-percent-annual-chance flood event.
WTR_NM	R	Surface Water Feature Name. This is the formal name of the surface water feature associated with the coastal structure.
CERT_STAT	R	Certification Status. This describes the type of certification that the coastal structure possesses. This field is populated for structures that protect up to the 1-percent-annual-chance flood. Acceptable values for this field are listed in the D_Cert_Status table.
STRUCT_LEN	R	Structure Length. This field stores the length of the coastal structure.
LEN_UNIT	R	Length Units. This is the unit of measure for the structure length. Acceptable values for the field are listed in the D_Length_Units table.
STRUCT_MTL	R	Structure Material. This describes the type of material of which the structure is composed. Acceptable values for this field are listed in the D_Struct_Mtl table.
SURVEY_DT	A	Survey Date. Date of the structure survey. This field is populated when the structure is surveyed.
SURVEY_TM	A	Survey Time. Time of the structure survey. This value should be formatted as hh:mm. This field is populated when the time of the survey is available.

**Table: L\_Cst\_Struct [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
CST_STR_ID	R	Text	25		N/A
STRUCT_ID	R	Text	25		S_GEN_STRUCT
CERT_DOC	A	Text	60		N/A
WTR_NM	R	Text	100		N/A
CERT_STAT	R	Text	50		D_CERT_STATUS
STRUCT_LEN	R	Double	Default		N/A
LEN_UNIT	R	Text	11		D_LENGTH_UNITS
STRUCT_MTL	R	Text	8		D_STRUCT_MTL
SURVEY_DT	A	Date	Default	0	N/A
SURVEY_TM	A	Text	10		N/A

**L.8.40 Table L\_Cst\_Tsct\_Elev****[October 2011]**

The L\_Cst\_Tsct\_Elev table is required for all coastal studies that utilize coastal transects and when transects are included in the Coastal Transect Parameters table in the FIS report. This table contains information about stillwater elevations at coastal transects for each event type. It is used to create the Coastal Transect Parameter table in the FIS report. There can be multiple elevation records in this table for each coastal transect located in the S\_Cst\_Tsct\_Ln feature class.

The L\_Cst\_Tsct\_Info table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
CT_INFO_ID	R	Primary key for table lookup. Assigned by table creator.
TRAN_LN_ID	R	Foreign key to S_Cst_Tsct_Ln. Used to join each transect in S_Cst_Tsct_Ln to stillwater elevations for each event type at the corresponding transect.
EVENT_TYP	R	Flood Event. Identifies the annual percent chance of exceedance for a flooding event such as 0.2-, 1-, 2-, 4-, and 10-percent. Acceptable values for this field are listed in the D_Event table.
WSEL_START	A	Starting Stillwater Elevation at this transect for the specified event type.
WSEL_MIN	A	Minimum Stillwater Elevation at this transect for the specified event type. If a range of stillwater elevations is specified, this value must be the minimum value.
WSEL_MAX	A	Maximum Stillwater Elevation at this transect for the specified event type. If a range of stillwater elevations is specified, this value must be the minimum value.

**Table L\_Cst\_Tsct\_Elev [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
CT_INFO_ID	R	Text	25		N/A
TRAN_LN_ID	R	Text	25		S_CST_TSCT_LN
EVENT_TYP	R	Text	25		D_EVENT
WSEL_START	A	Double	Default	1	N/A
WSEL_MIN	A	Double	Default	1	N/A
WSEL_MAX	A	Double	Default	1	N/A

**L.8.41 Table: L\_ManningsN****[October 2011]**

L\_ManningsN table contains information on Manning's "n" or "k" roughness coefficients used in the flood risk project to create the FIS report Roughness Coefficients table.

The L\_ManningsN table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
MANN_ID	R	Primary key for table lookup. Assigned by table creator.
WTR_NM	R	Surface Water Feature Name. This is the formal name of the surface water feature associated with the Mannings "N" value.
CHANNEL_N	R	Channel Roughness Coefficient. This is the roughness coefficient for the channel. This is normally a number between 0.01 and 0.2. For a range of roughness coefficients enter the range as it will appear in the FIS report table ( i.e. "0.01 to 0.2.")
OVERBANK_N	R	Overbank Roughness Coefficient. This is the roughness coefficient for the overbank. This is normally a number between 0.01 and 0.2. For a range of roughness coefficients enter the range as it will appear in the FIS report table ( i.e. "0.01 to 0.2.")
LANDCOVER	R	Land Cover. This is a description of the land cover used in the hydraulic analysis. Examples include short grass, boulders, dense brush, etc.

**Table: L\_ManningsN [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
MANN_ID	R	Text	25		N/A
WTR_NM	R	Text	100		N/A
CHANNEL_N	R	Text	12		N/A
OVERBANK_N	R	Text	12		N/A
LANDCOVER	R	Text	254		N/A

**L.8.42 Table: L\_Meetings****[October 2011]**

The L\_Meetings table is completed to capture information regarding meetings that are referenced in the FIS report. This information is used in the FIS report Community Meetings table.

The L\_Meetings table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
MTG_ID	R	Primary key for this table. Assigned by table creator.
COM_NFO_ID	R	Community Information Identification. This attribute links to the table L_Comm_Info that contains information about the specific community. This table must contain a number that matches a corresponding number in the COM_NFO_ID field of the S_POL_AR table.
MTG_TYP	R	Type of meeting. Acceptable values for this field are listed in the D_Mtg_Typ table.
MTG_DATE	R	Date of meeting.
MTG_LOC	R	Meeting Location. Include address, city, and ZIP code.
MTG_PURP	R	Purpose of meeting.
FIS_EFF_DT	R	Effective date of the FIS report discussed at meeting.

**Table: L\_Meetings [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
MTG_ID	R	Text	25		L_MTG_POC
COM_NFO_ID	R	Text	11		L_COMM_INFO
MTG_TYP	R	Text	100		D_MTG_TYP
MTG_DATE	R	Date	Default	0	N/A
MTG_LOC	R	Text	100		N/A
MTG_PURP	R	Text	100		N/A
FIS_EFF_DT	R	Date	Default	0	N/A

**L.8.43 Table: L\_MT2\_LOMR****[October 2011]**

The L\_MT2\_LOMR table lists the effective Letters of Map Revision (LOMRs), by FIRM panel, incorporated into FIRM data submitted to FEMA as part of the study. It is used to populate the FIS report LOMRs table.

The L\_MT2\_LOMR table includes all LOMRs that will be incorporated into or superseded by the new maps. This is to alert reviewers and ensure that all LOMRs are incorporated correctly into the new flood risk project, as necessary. The L\_MT2\_LOMR table should contain at least one record for each LOMR on the Preliminary and Final SOMA. There will be multiple records for any LOMR that spans multiple FIRM panels.

The L\_MT2\_LOMR table contains the following elements.

DFIRM_ID	R	Study Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
LOMR_ID	R	Primary key for table lookup. Assigned by table creator.
CASE_NO	R	Case Number. This is the case number of the LOMR that is assigned by FEMA. The case number is used to track the LOMR's supporting documentation. This value is used in the FIS report LOMRs table.
EFF_DATE	R	Effective Date. Effective date of the LOMR. This value is used in the FIS Report LOMRs table.
WTR_NM	R	Primary Flooding Source of the LOMR. This is the formal name of the surface water feature, as it appears on the hardcopy FIRM and on the LOMR.
FIRM_PAN	R	FIRM Panel Number of the LOMR area. This is the complete 11-digit FIRM panel number, which is made up of ST_FIPS, PCOMM, PANEL, and SUFFIX. This is the FIRM panel number that is shown in the title block of the map. There may be multiple records for each LOMR if the LOMR falls on multiple panels.
STATUS	R	Status of the LOMR. Acceptable values for this field are listed in the D_Lomc_Status Table. This value is used in the FIS Report LOMRs table.
SCALE	R	Map Scale. This is the denominator of the effective LOMR scale as a ratio. For example, 24000 is the denominator for a 1" = 2000' map. Acceptable values for this field are listed in the D_Scale table.

Table: L\_MT2\_LOMR [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
LOMR_ID	R	Text	25		N/A
CASE_NO	R	Text	13		N/A
EFF_DATE	R	Date	Default	0	N/A
WTR_NM	R	Text	100		N/A
FIRM_PAN	R	Text	11		S_FIRM_PAN
STATUS	R	Text	12		D_LOMC_STATUS
SCALE	R	Text	5		D_SCALE



**L.8.44 Table: L\_Mtg\_POC****[October 2011]**

The L\_Mtg\_POC table is completed to capture information regarding meeting points of contact that are referenced in the FIS report. This information is used in the FIS report Meetings table.

The L\_Mtg\_POC table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
MTG_POC_ID	R	Primary key for this table. Assigned by table creator.
MTG_ID	R	Meeting Identifier. Foreign key to the L_Meetings table.
NAME	R	Contact Name.
CNT_TITLE	A	Contact Position or Title.
AGENCY	R	Contact Agency Name.
AGY_ROLE	A	Role of Contact Agency.
ADDRESS	A	Contact Address.
CITY	A	Contact City.
STATE	A	Contact State Abbreviation. Acceptable values for this field are listed in the D_State_Name table.
ZIP	A	Contact Zip Code.
PHONE	A	Contact Primary Phone Number. Only numbers ( i.e. 3035551212).
PHONE_EXT	A	Contact Primary Phone Number Extension. For example, x2345.
EMAIL	A	Contact E-mail Address.

Table: L\_Mtg\_POC [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
MTG_POC_ID	R	Text	25		N/A
MTG_ID	R	Text	25		L_MEETINGS
NAME	R	Text	50		N/A
CNT_TITLE	A	Text	50		N/A
AGENCY	R	Text	50		N/A
AGY_ROLE	A	Text	50		N/A
ADDRESS	A	Text	100		N/A
CITY	A	Text	25		N/A
STATE	A	Text	24		D_STATE_NAME
ZIP	A	Text	10		N/A
PHONE	A	Text	10		N/A
PHONE_EXT	A	Text	6		N/A
EMAIL	A	Text	50		N/A

**L.8.45 Table: L\_Pan\_Revis****[October 2011]**

This table will not apply for an initial FIRM or for a FIRM that has a completely new paneling scheme such as a first-time countywide FIRM. Otherwise, this table is required for all Preliminary or Final FIRM Databases.

The L\_Pan\_Revis table is a lookup table that contains information about historic revisions to each FIRM panel.

For each FIRM panel being revised, there must be at least one record. There will be multiple records for a single revision date if there are multiple revision notes for that date. Each FIRM panel may have a unique set of revision dates and revision codes. There must be one record for each FIRM\_PAN, REVIS\_DATE, and REVIS\_NOTE combination.

The L\_Pan\_Revis table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
REVIS_ID	R	Primary key for table lookup. Assigned by table creator.
FIRM_PAN	R	FIRM Panel Number. This field links to the S_FIRM_Pan table. This must match a value in the FIRM_PAN field of the S_FIRM_Pan table. This is the complete FIRM panel number, which is made up of ST_FIPS, PCOMM, PANEL, and SUFFIX, which are found in S_FIRM_Pan table. The FIRM panel number is the 11-digit FIRM panel number that is shown in the title block of the map.
REVIS_DATE	R	Revision Date. Effective date of revision to the FIRM panel.
REVIS_NOTE	R	Revision Note. Note describing the reason for the revision to the panel. A list of standard revision notes appears in <i>Appendix K</i> of these Guidelines.

**Table: L\_Pan\_Revis [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
REVIS_ID	R	Text	25		N/A
FIRM_PAN	R	Text	11		S_FIRM_PAN
REVIS_DATE	R	Date	Default	0	N/A
REVIS_NOTE	R	Text	254		N/A

**L.8.46 Table: L\_Pol\_FHBM****[October 2011]**

This table will not apply if all communities on the FIRM never had revisions to their Flood Hazard Boundary Maps (FHBM). Otherwise, this table is required for all FIRM Databases.

The L\_Pol\_FHBM table is a lookup table that contains a list of communities and FHBM revisions.

Each community may have different revision dates. Each revision date may have multiple revision notes.

The L\_Pol\_FHBM table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
FHBM_ID	R	Primary key for this table. Assigned by table creator
CID	R	Community Identification Number. This is the six-digit community number assigned by FEMA. It is created by combining the State FIPS code with the COMM_NO. If the jurisdiction does not have a community number assigned by FEMA, the CID is created by combining the State FIPS code with the abbreviation contained in the COMM_NO field (FED, ST, or OTHR)
FHBM_DATE	R	Effective Date of Flood Hazard Boundary Map. This field is used to populate the FIS report Community Map History table.
FHBM_NOTE	R	Flood Hazard Boundary Map Notes. A list of standard revision notes appears in <i>Appendix K</i> of these Guidelines.

**Table: L\_Pol\_FHBM [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
FHBM_ID	R	Text	25		N/A
CID	R	Text	6		S_POL_AR
FHBM_DATE	R	Date	Default	0	N/A
FHBM_NOTE	R	Text	254		N/A

**L.8.47 Table: L\_Profil\_Bkwtr\_El****[October 2011]**

The L\_Profil\_Backwtr\_El table is required when the stream profile in the FIS text includes backwater elevation, if and when the data can be exported from RASPLLOT in *Appendix L* format. This table stores the backwater elevations for each flood frequency by stream.

The L\_Profil\_Bkwtr\_El table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
PROF_BW_ID	R	Primary key for table lookup. Assigned by table creator.
WTR_NM	R	Surface Water Feature Name. This is the name of the stream or water body.
EVENT_TYP	R	Flood Event. Identifies the annual percent chance of exceedance for a flooding event such as 0.2-, 1-, 2-, 4-, and 10-percent. Acceptable values for this field are listed in the D_Event table.
BKWTR_WSEL	R	Backwater Water-Surface Elevation. This is the backwater water-surface elevation for the flood event specified in the EVENT field. This value is used in the FDTs and profiles.
LEN_UNIT	R	Width and Elevation Units. This unit indicates the measurement system used for the water-surface elevation. Normally, this would be feet. Acceptable values for this field are listed in the D_Length_Units table.
V_DATUM	R	Vertical Datum. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally, this would be NAVD88. Acceptable values for this field are listed in the D_V_Datum table.

**Table: L\_Profil\_Bkwtr\_El**

Field	R/A/O	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
PROF_BW_ID	R	Text	25		N/A
WTR_NM	R	Text	100		N/A
EVENT_TYP	R	Text	25		D_EVENT
BKWTR_WSEL	A	Double	Default		N/A
LEN_UNIT	R	Text	11		D_LENGTH_UNITS
V_DATUM	R	Text	17		D_V_DATUM

**L.8.48 Table: L\_Profil\_Label****[October 2011]**

The L\_Profil\_Label table is required when the stream profile in the FIS text includes user-defined landmark labels that are not associated with specific cross sections or structures, if and when the data can be exported from RASLOT in *Appendix L* format. This table stores the labels needed for FIS profiles by stream.

The L\_Profil\_Label table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
PROFLBL_ID	R	Primary key for table lookup. Assigned by table creator.
WTR_NM	R	Surface Water Feature Name. This is the name of the stream or water body.
STREAM_STN	R	Stream Station. This is the measurement along the profile baseline to the cross section location. This value is used in the FDTs and profiles.
ELEV	R	Elevation. This is the elevation at which the text will be labeled on the profile.
DESCR	R	Description. This is the user-defined description of the landmark that is to be placed in the FIS profile at this location.
ORIENT	R	Orientation of Text. This is the orientation of the text. Acceptable values for this field are listed in the D_Prof_Lbl_Orient table.
ADJUSTED	R	Adjustment of Text. This provides additional information about the placement of the text. Acceptable values are LEFT, RIGHT, or CENTER for vertical text and TOP, MIDDLE, or BOTTOM for horizontal text. Acceptable values for this field are listed in the D_Prof_Lbl_Adjust table.
UNDERLINE	R	Is Text Underlined? Acceptable values for this field can be found in the D_TrueFalse domain table.
LEN_UNIT	R	Width and Elevation Units. This unit indicates the measurement system used for the stream stationing and water-surface elevation. Normally, this would be feet. Acceptable values for this field are listed in the D_Length_Units table.
V_DATUM	R	Vertical Datum. The vertical datum indicates the reference surface from which the elevations are measured. Normally, this would be NAVD88. Acceptable values for this field are listed in the D_V_Datum table.

Table: L\_Profil\_Label

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
PROFLBL_ID	R	Text	25		N/A
WTR_NM	R	Text	100		N/A
STREAM_STN	R	Double	Default		N/A
ELEV	R	Double	Default		N/A
DESCR	R	Text	80		N/A
ORIENT	R	Text	10		D_PROF_LBL_ORIENT
ADJUSTED	R	Text	6		D_PROF_LBL_ADJUST
UNDERLINE	R	Text	1		D_TRUEFALSE
LEN_UNIT	R	Text	11		D_LENGTH_UNITS
V_DATUM	R	Text	17		D_V_DATUM



**L.8.49 Table: L\_Source\_Cit****[October 2011]**

L\_Source\_Cit is used to document the sources of data used in the FIRM Database and FIS report. The table standardizes input used in many other tables within the FIRM Database as well as input used for generating metadata. In addition, this table contains all bibliography entries intended for use in the Bibliography and References table in the FIS report text. It is required for all submittals.

The L\_Source\_Cit table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
SOURCE_CIT	R	Source Citation identifier used in the FIRM Database and in the FIRM metadata file. Default source abbreviations are listed in Table L-3 of this document. Source citations start with the type of source, followed by sequential numbers, for example "BASE1," "BASE2," etc.
CITATION	A	Citation Used in FIS report text and Bibliography and References Table. A short and unique citation name (Author and Year) used within the FIS report to reference this publication, such as "US Census 2010."
PUBLISHER	R	Publisher Name Used in FIS Report Bibliography and References Table.. This is the name of the publishing entity.
TITLE	R	Title of referenced publication or data Used in FIS Report Bibliography and References Table. Should include a volume number if applicable.
AUTHOR	A	Author/Editor Used in FIS Report Bibliography and References Table.. This is the author or editor of the reference. Multiple authors may be listed in this field.
PUB_PLACE	A	Publication Place Used in FIS Report Bibliography and References Table. This is the place of publication (i.e. "Washington DC").
PUB_DATE	R	Publication Date Used in FIS Report Bibliography and References Table. This is the date of publication or date of issuance. This field is a free text field to allow for various date formats and ranges. Reprint dates may also be included if applicable.
WEBLINK	A	Reference Web Address Used in FIS Report Bibliography and References Table. This is the web address for the reference, if applicable.
SRC_SCALE	A	Scale of the source data, if applicable. For example 1:24000. Used in FIS Report Bibliography and References Table.
MEDIA	R	Media on which the source data were received.

Table: L\_Source\_Cit [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
SOURCE_CIT	R	Text	11		All Spatial Tables
CITATION	A	Text	25		N/A
PUBLISHER	R	Text	254		N/A
TITLE	R	Text	254		N/A
AUTHOR	A	Text	254		N/A
PUB_PLACE	A	Text	100		N/A
PUB_DATE	R	Text	30		N/A
WEBLINK	A	Text	128		N/A
SRC_SCALE	A	Text	12		N/A
MEDIA	R	Text	50		N/A

**L.8.50 Table: L\_Summary\_Discharges****[October 2011]**

The L\_Summary\_Discharges table is required when a Summary of Discharges table is to be included in the FIS report. This table stores the hydrologic information, including drainage area and peak discharges, associated with the node. This table contains information used in the Summary of Discharges table in the FIS report.

The nodes to be included in the Summary of Discharges table should be at or near major road or street crossings, upstream and downstream of major tributaries (where base flood discharge changes by at least 25-percent), at diversions of flow from the channel, at or near gaging stations, at corporate or county boundaries, and at major flood control structures. In the absence of these locations, nodes should be included in the Summary of Discharges table when there is an approximately 25-percent change in the base flood discharge.

The L\_Summary\_Discharges table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
SUMDSCH_ID	R	Primary key for table lookup. Assigned by table creator
NODE_ID	R	Node Identification. This is the foreign key to the S_Nodes table. The node is associated with the subbasin. This field is populated to show whether or not the discharge is to be included in the Summary of Discharges table in the FIS report.
NODE_DESC	R	Node Location Description. This describes the location of the node. This name must match what is used in the model and will be shown in the Summary of Discharges Table in the FIS report text. It must be unique across a watershed. Examples of this value include "Downstream of State Route 234," "At the confluence of Hillton Run," and "Approximately 1.08 miles upstream of confluence with McIntosh Run."
DRAIN_AREA	R	Drainage Area. This is the contributing drainage area. For alluvial fan studies, this is the "above the apex" value.
AREA_UNIT	R	Area Units. This unit indicates the measurement system used for the drainage area. Normally, this would be square miles. Acceptable values for this field are listed in the D_Area_Units table.
EVENT_TYP	R	Flood Event. Identifies the annual percentage of the chance of exceedance for a flooding event, such as 0.2-, 1-, 2-, 4, and 10-percent. Acceptable values for this field are listed in the D_Event table.
DISCH	R	Discharge. Existing conditions discharge at the node for the flood event described in the EVENT_TYP field. This is the cumulative discharge based on the total drainage above the node.

DISCH_UNIT	R	Discharge Units. This unit indicates the measurement system used for the discharge associated with the drainage area. Normally, this would be cubic feet per second (cfs). Acceptable values for this field are listed in the D_Discharge_Units table.
WSEL	A	Water-Surface Elevation. Water-surface elevation at the node for the flood event described in the EVENT_TYP field. This field is populated when cross sections are not utilized in the engineering analysis.
WSEL_UNIT	A	Water-Surface Elevation Units. This unit indicates the measurement system used for the water-surface elevation. Normally, this would be feet. This field is populated when cross sections are not utilized in the engineering analysis. Acceptable values for this field are listed in the D_Length_Units table.
V_DATUM	A	Vertical Datum. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally, this would be NAVD88. This field is populated when cross sections are not utilized in the engineering analysis. Acceptable values for this field are listed in the D_V_Datum table.
SHOWN_FIS	R	Shown in FIS Summary of Discharges table. This field determines whether the discharge at this node is to be included in the FIS Summary of Discharges table. Acceptable values for this field are listed in the D_TrueFalse table.

**Table: L\_Summary\_Discharges [October 2011]**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
SUMDSCH_ID	R	Text	25		N/A
NODE_ID	R	Text	25		S_NODES
NODE_DESC	R	Text	100		N/A
DRAIN_AREA	R	Double	Default	1	N/A
AREA_UNIT	R	Text	17		D_AREA_UNITS
EVENT_TYP	R	Text	25		D_EVENT
DISCH	R	Double	Default		N/A
DISCH_UNIT	R	Text	20		D_DISCHARGE_UNITS
WSEL	A	Double	Default	2	N/A
WSEL_UNIT	A	Text	11		D_LENGTH_UNITS
V_DATUM	A	Text	17		D_V_DATUM
SHOWN_FIS	R	Text	1		D_TRUEFALSE

**L.8.51 Table: L\_Summary\_Elevations****[October 2011]**

The L\_Summary\_Elevations table is required when a Summary of Non-Coastal Stillwater Elevations table is included in the FIS report. This table stores the static elevation information for water bodies including lakes, reservoirs, and ponds. This table contains information only for those water area features that will be included in the Summary of Non-Coastal Stillwater Elevations table in the FIS report.

The L\_Summary\_Elevations table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter "C" (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
SUMELEV_ID	R	Primary key for table lookup. Assigned by table creator
NODE_ID	R	Node Identification. This is the foreign key to the S_Nodes table. The node is associated with the subbasin. This field is populated when the subbasin has a node that is shown in the Summary of Discharges table in the FIS report.
EVENT_TYP	R	Flood Event. Identifies the annual percent chance of exceedance for a flooding event such as 0.2-, 1-, 2-, 4-, and 10-percent. Acceptable values for this field are listed in the D_Event table.
WSEL	R	Water-Surface Elevation. This is the water-surface elevation for the flooding event specified in the EVENT_TYP field. This field is populated when the flood is analyzed for the water body area in the hydraulic model.
WSEL_UNIT	R	Water-Surface Elevation Units. This field is populated when the flood is analyzed for the water body area in the hydraulic model. This unit indicates the measurement system used for the water-surface elevation. Normally, this would be feet. Acceptable values for this field are listed in the D_Length_Units table.
V_DATUM	R	Vertical Datum. The vertical datum indicates the reference surface from which the water-surface elevations are measured. Normally, this would be NAVD88. Acceptable values for this field are listed in the D_V_Datum table.

Table: L\_Summary\_Elevations [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
SUMELEV_ID	R	Text	25		N/A
NODE_ID	R	Text	25		S_NODES
EVENT_TYP	R	Text	25		D_EVENT
WSEL	R	Double	Default	2	N/A
WSEL_UNIT	R	Text	11		D_LENGTH_UNITS
V_DATUM	R	Text	17		D_V_DATUM

### L.8.52 Table: L\_XS\_Elev

[October 2011]

The L\_XS\_Elev table is required for hydraulic models that utilize cross sections and when the cross section is included in the Floodway Data Tables in the FIS report, or is shown on the FIRM, or is used for plotting the profile. This table contains information for those cross sections that will be included in the Floodway Data Table in the FIS report or are shown on the FIRM or are used for plotting the profile. Both lettered and non-lettered cross sections may be included in this table. This table includes cross-section information for all event types, and for levee and future conditions scenarios. For studies of high-risk stream reaches such as Zone AE areas, cross sections are required to be shown on the FIRM and flood profile at significant profile inflection points (breaks in the profiles) or as close to the inflection points as possible. The mapping partner responsible for the hydraulic analysis should select cross sections so that linear interpolation between two cross sections is minimally different than the base flood profile (no more than a 0.5 foot difference). In areas where the profile is flat, the mapping partner should choose at least two cross sections per FIRM panel. This table stores the hydraulic information, including water-surface elevations, velocity, and floodway width, associated with the cross section.

For cross sections along levees, there may be up to three records per cross section per event type to reflect the following modeling scenarios: with right levee, with left levee, and with both levees. In these situations, for each scenario, the WTR\_NM field should also reflect that scenario as it would be shown in the profile title block (e.g., “Big River with Right Levee”).

The L\_XS\_Elev table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter “C” (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
XS_ELEV_ID	R	Primary key for table lookup. Assigned by table creator.
XS_LN_ID	R	Foreign key to S_XS table. This field captures the cross section line identification number that corresponds to this record. This is used in order to link a cross section to multiple elevation records.
FW_WIDTH	A	Floodway Width. Width of the floodway at this cross section as shown in the Floodway Data table. This field is populated when a floodway is defined. This value is used in the FDTs.
NE_WIDTH_L	A	Non-Encroachment Zone Width, Left Side. This is the width of the non-encroachment zone at this cross section as shown in the Non - Encroachment Zone Data table. This field is populated when a non-encroachment zone is defined.
NE_WIDTH_R	A	Non-Encroachment Zone Width, Right Side. This is the width of the non-encroachment zone at this cross section as shown in the Non - Encroachment Zone Data table. This field is populated when a non-encroachment zone is defined.

XS_AREA	A	Cross Section Area. Area of the cross section underwater for the width of the floodway as shown in the Floodway Data table. This field is populated when a floodway is defined. This value is used in the FDTs.
AREA_UNIT	A	Area Unit. This unit specifies the areal unit for the area of the cross section underwater for the width of the floodway. This field is populated when a floodway is defined. This value is used in the FDTs. Acceptable values for this field are listed in the D_Area_Units table.
VELOCITY	A	Mean Velocity. The mean velocity of the floodway at this cross section as shown in the Floodway Data table. This field is populated when a floodway is defined. This value is used in the FDTs.
VEL_UNIT	A	Velocity Measurement. This unit specifies the unit of measurement for the velocity of the floodway. This field is populated when a floodway is defined. This value is used in the FDTs. Acceptable values for this field are listed in the D_Velocity_Units table.
EVENT_TYP	R	Flood Event. Identifies the annual percent chance of exceedance for a flooding event such as 0.2-, 1-, 2-, 4-, and 10-percent. Acceptable values for this field are listed in the D_Event table.
WSEL	R	Water-Surface Elevation. This is the water-surface elevation for the flood event specified in the EVENT field at the cross section. This value is used in the FDTs for the 1-percent-annual-chance and 1-percent-annual-chance future event types. This elevation exactly matches the elevation of the flood event in the Flood Profiles and the Floodway Data table in the FIS report. This value should include backwater but if it does not, the CALC_WO_BW field must be coded "T."
		When a levee is present, this is the Regulatory Water Surface Elevation with Levee. If there is only one levee on the stream, and it is de-accredited, this is the regulatory water-surface elevation for the 1-percent-annual-chance flood at the cross section. If there is only one levee on the stream and it is accredited, this is the regulatory water-surface elevation computed with the assumption that the levee is in place. If there are two levees on the stream and both are de-accredited, this value is the regulatory elevation computed with no levees in place. If there are two levees on the stream and one levee is de-accredited, this value is the regulatory elevation computed without consideration of the de-accredited levee. If there are two levees on the stream and both are accredited, this value is the regulatory elevation computed with the assumption that the levees are in place.
WSEL_WOFWY	A	Base Flood Water-Surface Elevation Without Floodway. This is the water-surface elevation of the base flood without the floodway calculated at this cross section. This number is determined during the engineering analysis for the flood risk project. This value should match the "without floodway" column in the Floodway Data table in the FIS report. This field is populated when a floodway is defined, usually only for the 1-percent-annual-chance event. This value is used in the FDTs.



WSEL_FLDWY	A	Base Flood Water-Surface Elevation With Floodway. This is the water-surface elevation of the base flood with the floodway calculated at this cross section. This number is determined during the engineering analysis for the flood risk project. This value should match the “with floodway” column in the Floodway Data table in the FIS report. This field is populated when a floodway is defined, usually only for the 1-percent-annual-chance flood event. This value is used in the FDTs.
WSEL_INCRS	A	Increase between Base Flood Water-Surface Elevation Without Floodway and With Floodway. This is difference between the calculated water-surface elevations for the 1-percent-annual-chance flood event with and without the floodway. This value may be calculated by subtracting the WSEL_WOFWY value from the WSEL_FLDWY value. If the Floodway Data table is published, this value should match the increase column in the Floodway Data table in the FIS report. This field is populated when a floodway is defined, usually only for the 1-percent-annual-chance flood event. This value is used in the FDTs.
LEN_UNIT	R	Width and Elevation Units. This unit indicates the measurement system used for the water-surface elevation and floodway width. Normally, this would be feet. This value is used in the FDTs and profiles. Acceptable values for this field are listed in the D_Length_Units table.
V_DATUM	R	Vertical Datum. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally, this would be NAVD88. This value is used in the FDTs and profiles. Acceptable values for this field are listed in the D_V_Datum table.
LEVEE_TF	R	Cross Section is Associated with Levee(s). Acceptable values for this field are listed in the D_TrueFalse table.
LVSCENARIO	A	Cross Section Levee Scenario. This field describes the modeled levee scenario. Acceptable values for this field are listed in the D_Levee_Scenario table.
WSELREG_LL	A	Regulatory Water Surface Elevation for the 1-Percent-Annual Chance Flood Event for the Left Levee. If there are two levees on the stream and both are de-accredited, this is the regulatory water-surface elevation landward of the left levee for the 1-percent-annual-chance flood at the cross section. The calculated value includes backwater. This field is populated when the cross section is associated with de-accredited levees on the left and right banks.
WSELREG_RL	A	Regulatory Water Surface Elevation for the 1-Percent-Annual Chance Flood Event for the Right Levee. If there are two levees on the stream and both are de-accredited, this is the regulatory water-surface elevation landward of the right levee for the 1-percent-annual-chance flood at the cross section. The calculated value includes backwater. This field is populated when the cross section is associated with de-accredited levees on the left and right banks.
FREEBRD_LL	R	Freeboard Value of the Left Levee. The freeboard value above the 1-PCT Annual Chance Flood water-surface elevation at the cross section. This field is only required if and when the data can be exported from RASLOT in <i>Appendix L</i> format.

FREEBRD_RL	R	Freeboard Value of the Right Levee. The freeboard value above the 1-percent-annual-chance elevation at the cross section. This field is only required if and when the data can be exported from RASPLOT in <i>Appendix L</i> format.
CALC_WO_BW	R	Calculated Without Backwater Effects Note. This indicates whether the elevations listed for this cross section are calculated without backwater effects. This is used to add a footnote to the Floodway Data Table. Acceptable values for this field are listed in the D_TrueFalse table.
SEQ	A	Sequence. This is the order in which the cross sections plot on the profile. This value is needed for profiles. This field is only required if and when the data can be exported from RASPLOT in <i>Appendix L</i> format.

Table: L\_XS\_Elev [October 2011]

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
XS_ELEV_ID	R	Text	25		N/A
XS_LN_ID	R	Text	25		S_XS
FW_WIDTH	A	Double	Default		N/A
NE_WIDTH_L	A	Double	Default		N/A
NE_WIDTH_R	A	Double	Default		N/A
XS_AREA	A	Double	Default		N/A
AREA_UNIT	A	Text	17		D_AREA_UNITS
VELOCITY	A	Double	Default		N/A
VEL_UNIT	A	Text	30		D_VELOCITY_UNITS
EVENT_TYP	R	Text	25		D_EVENT
WSEL	R	Double	Default		N/A
WSEL_WOFWY	A	Double	Default		N/A
WSEL_FLDWY	A	Double	Default		N/A
WSEL_INCRS	A	Double	Default		N/A
LEN_UNIT	R	Text	11		D_LENGTH_UNITS
V_DATUM	R	Text	17		D_V_DATUM
LEVEE_TF	R	Text	1		D_TRUEFALSE
LVSCENARIO	A	Text	16		D_LEVEE_SCENARIO
WSELREG_LL	A	Double	Default		N/A
WSELREG_RL	A	Double	Default		N/A
FREEBRD_LL	R	Double	Default		N/A
FREEBRD_RL	R	Double	Default		N/A
CALC_WO_BW	R	Text	1		D_TRUEFALSE
SEQ	A	Short Integer	Default		N/A

**L.8.53 Table: L\_XS\_Struct****[October 2011]**

The L\_XS\_Struct table is required when the cross section is associated with a structure (other than a levee) shown on the profile. This table is only required if and when the data can be exported from RASPLOT in *Appendix L* format. There will be two records per structure in this table – one for the downstream face of the structure and one for the upstream face of the structure. This table stores information needed to plot the structure on the profile.

The L\_XS\_Struct table contains the following elements.

DFIRM_ID	R	Flood Risk Project Identifier. For a single-jurisdiction flood risk project, the value is composed of the two-digit State FIPS code and the four-digit FEMA CID code (e.g., 480001). For a countywide flood risk project, the value is composed of the two-digit State FIPS code, the three-digit county FIPS code, and the letter “C” (e.g., 48107C). Within each FIRM Database, the DFIRM_ID value will be identical.
VERSION_ID	R	Version Identifier. Identifies the product version and relates the feature to standards according to how it was created.
XS_STR_ID	R	Primary key for table lookup. Assigned by table creator.
XS_LN_ID	R	Cross Section Line ID. This is the foreign key to the S_XS table. This field captures the cross section line identification number that corresponds to this record. This is used in order to link a cross section to multiple structure records.
STRUCT_TYP	R	Structure Type. Hydraulic structures within the flood risk project area. Acceptable values for this field are listed in the D_Struct_Typ table.
WTR_NM	R	Surface Water Feature Name. This is the name of the stream or water body. This value is used in the profiles.
STRUC_FACE	R	Structure Face. This is the face of the structure (e.g., UPSTREAM or DOWNSTREAM). Acceptable values for this field are listed in the D_Struct_Face table.
STR_STN	R	Structure Station. This is the measurement along the profile baseline to the face of the structure described in the STRUC_FACE field, as measured from the STN_START point. This value is needed for profiles.
LO_CHRD_EL	R	Low-chord Elevation at the Face of the Structure. For bridges, this is the structure bottom of the deck or beam elevation at the face of the bridge. It is at the same location when measured vertically from the ground point with the lowest streambed elevation in the main channel. For culverts, this is the crown elevation at the face of the culvert. For dams and inline weirs, the low-chord elevation is not computed. This value is needed for profiles.
HI_CHRD_EL	R	High-chord Elevation at the Face of the Structure. This is the structure top of the deck or rail elevation at the face of the bridge, culvert, or inline weir. It is at the same location when measured vertically from the ground point with the lowest streambed elevation in the main channel. This value is needed for profiles.
STRMBED_EL	R	Streambed Elevation. This is the water-surface elevation for the thalweg or the lowest point in the main channel. For culverts, this is the invert elevation. This value is used in the profiles.
LEN_UNIT	R	Width and Elevation Units. This unit indicates the measurement system used for the water-surface elevation. Normally, this would be feet. Acceptable values for this field are listed in the D_Length_Units table.

**V\_DATUM**      **R**      Vertical Datum. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally, this would be NAVD88. Acceptable values for this field are listed in the D\_V\_Datum table.

**Table: L\_XS\_Struct**

Field	R/A	Type	Length/ Precision	Scale (SHP Only)	Joined Spatial / Lookup Tables or Domains
DFIRM_ID	R	Text	6		N/A
VERSION_ID	R	Text	11		N/A
XS_STR_ID	R	Text	25		N/A
XS_LN_ID	R	Text	25		S_XS
STRUCT_TYP	R	Text	60		D_STRUCT_TYP
WTR_NM	R	Text	100		N/A
STRUC_FACE	R	Text	10		D_STRUCT_FACE
STR_STN	R	Double	Default		N/A
LO_CHRD_EL	R	Double	Default		N/A
HI_CHRD_EL	R	Double	Default		N/A
STRMBED_EL	R	Double	Default		N/A
LEN_UNIT	R	Text	11		D_LENGTH_UNITS
V_DATUM	R	Text	17		D_V_DATUM

## **L.9. Metadata Example for Preliminary and Final Flood Insurance Rate Map Databases [October 2011]**

A metadata example for Preliminary and Final Flood Insurance Rate Map Databases can be found in the *FEMA NFIP Metadata Profile for Draft, Preliminary and Final DFIRM Datasets*.

### L.10. Domain Tables

[October 2011]

Valid values for domain tables referenced in this Appendix can be found in the *Guidelines and Standards for Flood Risk Analysis and Mapping Domain Tables Guide*.